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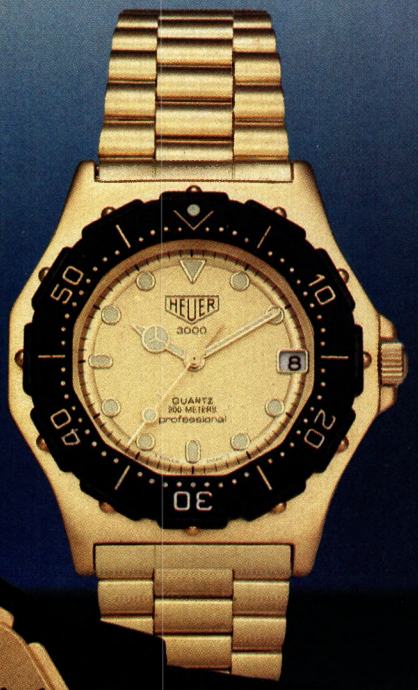
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CONTENTS

Volume Thirty-five *Number Three*

THE GOURMET DIVER	26	**ABALONE** /BONNIE J. CARDONE From burgers to exotic international fare
TREASURE DIVING	28	**TREASURE OF POVERTY ISLAND** /BILL BARADA New developments spark new interest
MISCELLANEOUS	34	**DIVERS ALERT NETWORK** /BONNIE J. CARDONE How to use it correctly
	134	**COLLECTING AND PRESERVING SKIN DIVER** /ROBERT FINCH A complete, bound set—no small feat
PHOTOGRAPHY	36	**GREAT NIKONOS SHOOTOUT** /BILL GLEASON
	90	**SEASPACE PHOTO CONTEST WINNERS** /KEN KNEZICK
	127	**TUSSEY FLASH ARM** /GERI MURPHY
DIVE EQUIPMENT	42	**TEKNA'S XENA LITE** /GERI MURPHY
	59	**SEATEC ORIGINAL MANTA BC** /JIM WALKER
	60	**SCUBAPRO'S G 250 REGULATOR** /ERIC HANAUER
	73	**COBRA WETSUIT** /BONNIE J. CARDONE
	128	**TABATA'S SNORKELING KIT** /BONNIE J. CARDONE
	130	**PLANA AVANTI FIN** /GERI MURPHY
LOCAL DIVING	43	**HAWAII** /JIM AND CATHY CHURCH Dive guide to the islands
	67	**FLORIDA'S WEST COAST** /STEVE LUCAS From Destin to Venice
	88	**DUTCH SPRINGS** /ROD CANHAM Pennsylvania quarry becomes diver playground
SDM'S U/W PHOTO CLASS	62	**LET'S REVIEW THE BASICS** /JIM AND CATHY CHURCH F/stops, depth of field, shutter speed, film speed
DIVE BOATS	64	**THE DONZI Z-29** /STEVE LUCAS
	66	**YAMAHA TWIN 150 OUTBOARDS** /FRED FISCHER
FOREIGN TRAVEL	75	**THE SUDAN** /CARL ROESSLER Adventure in the Southern Red Sea
	78	**BONAIRE BEACH HOTEL** /STEVE LUCAS Home of the Bonaire Scuba Center
	80	**BIMINI UNDERSEA ADVENTURES** /RICK FREHSEE For a memorable diving experience
	82	**CAYMAN ISLANDER** /GERI MURPHY Great dive package at a bargain price
	139	**DIVE NEWS FROM DOWN UNDER** /GERI MURPHY 1986 *Watersport* cruises
ADVENTURE	92	**BLUE WATER/BLUE SHARKS** /JIM WALKER High voltage action off Southern California
MARINE LIFE	98	**WET PETS** /HILLARY HAUSER The joys of tropical fish ownership
WRECK DIVING	116	**THE NORMANDIE** CHARLES IRA SACHS From luxury liner to dockside war casualty
I LEARNED ABOUT DIVING FROM THAT	146	**TRAPPED IN A CALIFORNIA CAVE** /HOWARD HALL

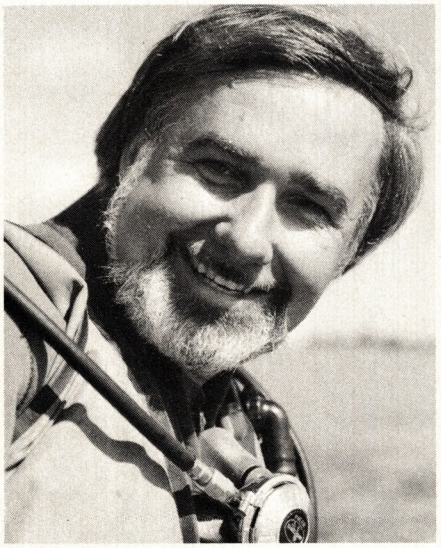
COLUMNS	16	**WRECK FACTS**	18	**DIVING MEDICINE**	38	**TECHNIFACTS**
DEPARTMENTS	13	**SCUBA QUIZ**	21	**CALENDAR**	141	**DIVER'S DIRECTORY**

COVER

Divers explore Pentagon off the Kona Coast of the island of Hawaii. Photo/Jim and Cathy Church. For more on Hawaii diving, see page 43. Inset photo: The amazing Donzi Z-29 is examined on page 64. Steve Lucas photo.

SDM Editorial

BY THE PUBLISHER



SCUBA: SAFETY COMES FIRST

Perhaps the most crucial aspect of this sport is *training*. Because of the harsh environment into which divers go, and because their life depends upon proper use of their equipment, training has become an issue of paramount importance. Scuba equipment sales and their crucial link with scuba training has become a matter of grave concern. On this issue scuba instructors and dive store owners are in complete agreement.

In the United States, we have a system of free enterprise and it is difficult to control the sale of almost anything. Anyone can sell anything they wish at whatever price they choose as long as it is not prohibited by specific state or federal laws. On one hand, the dive industry is fortunate to be free of such government controls and regulations. On the other hand, the very same industry is faced with the responsibility for the protection and safety of the consumer.

Compared to most sports, the scuba diving industry has been extraordinarily successful in its efforts to regulate the sale of equipment and link it directly to training. The industry has instituted a system of volunteer control (C-cards) in which most retail stores require enrollment in a training course or proof of scuba certification before they will sell, rent or fill scuba cylinders. This volunteer system, and the creation of the C-card concept, has probably been the single most important move in the development of a safety conscious sport. While this system may be far from perfect, it works. As a result, almost 200,000 people enroll in scuba training courses every year.

Even though the scuba diving industry has been immensely successful in the development and promotion of scuba training to the uninformed public, we still have areas of concern. More than one million people in the United States have undergone scuba training and certification, and yet there are still many people who do not realize the need for training. To those of us who have received training, it is almost unthinkable that anyone would attempt to use scuba gear without proper instruction, but it still happens.

One of the areas of greatest controversy is the mail order sale of scuba equipment. Many instructors and dive store owners protest this activity because they seriously fear this equipment will fall into the wrong hands. It is pretty frightening to think of a young teenager, eager to get into diving, buying scuba gear through the mail and then blundering into the ocean without any training or guidance. Is this theoretical situation really a problem?

The retail dive stores that offer scuba gear for sale through the mail have taken precautions to avoid this problem. For example, most of them advertise such equipment through magazines such as SKIN DIVER, knowing that the majority of readers are either certified divers or in the midst of obtaining training and certification. Many mail order advertisers voluntarily place warnings in their advertisements. These point out the inherent hazards of scuba diving and strongly recommend that the potential respondent seek proper training before purchasing equipment. In addition, mail order advertisers ship their scuba tanks empty to ensure that the customer must go to a dive store to have the tank filled before attempting to dive. Since most stores require proof of certification before filling a tank, the neophyte is stopped before he/she can enter the water. As a result of these precautions, there really have not been scuba fatalities directly attributable to obtaining scuba gear via mail order and using it without proper training.

An area of much greater danger than mail order is the sale of used dive equipment to the untrained and uninformed. Scuba equipment frequently appears at swap meets and garage sales throughout the United States. In many cases neither the seller of the equipment nor the potential buyer has any idea of the dangers of scuba diving. It is the blind leading the blind. How does this occur? Very simply, used dive equipment often falls into the hands of a second or third buyer who passes it along as just another piece of merchandise such as a pop-up toaster, set of golf clubs, or a used motorcycle. As a result, there is often no warning nor any recommendations offered at the time of sale. In some cases a scuba tank is actually full at the time of the transaction and the new buyer can go directly to the water without attempting to purchase a fill. This type of sale could end in tragedy.

The sale of used scuba equipment is perhaps the most perplexing problem that faces the dive industry because it is virtually impossible to control. These unauthorized sales take place under a wide variety of conditions ranging from an organized swap meet to a private sale in the backyard of a home. The dive industry finds it virtually impossible to provide a warning to the uninformed purchaser under these circumstances.

Another area of concern is the unauthorized use of scuba equipment by an uncertified friend of a diver. This occurs more frequently than most people would imagine. Visiting friends, relatives or neighbors request an opportunity to try the equipment in a backyard pool or in a quiet cove at the beach. It is hard to turn down such a request from a friend, and, with hesitancy and reluctance, the diver agrees. He knows it is not right but what could go wrong? In many cases, nothing does go wrong for the first few sessions. Pretty soon, the diver begins to feel he is a pretty good instructor. He forgets all of the rigorous training and tests he went through for basic certification and now only sees his friend having a good time and regarding him as a hero. It is only when something goes wrong that the diver realizes how ill prepared he is for the training task. A sudden wave breaks over the two divers in the surfline; his friend becomes entangled in his equipment; or his friend becomes overtired and exhausted. It is then that tragedy strikes.

(Continued on Page 24)

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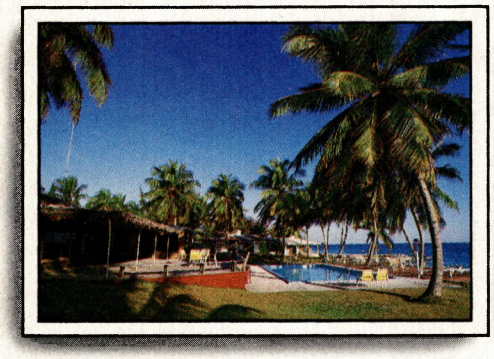
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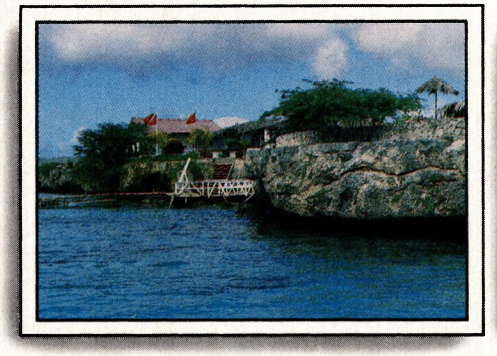
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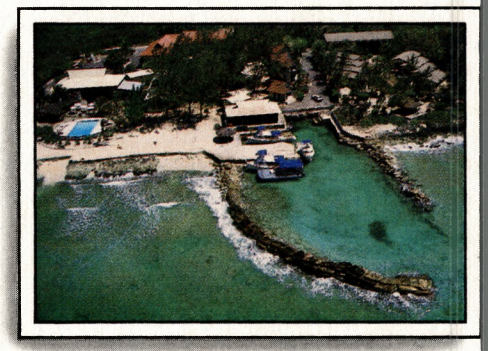
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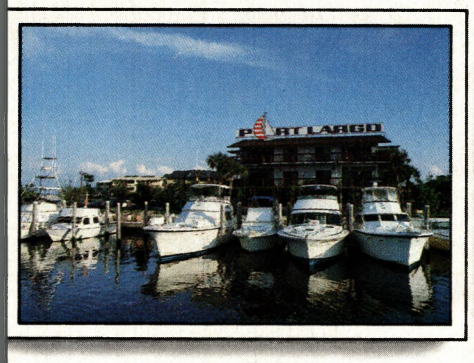
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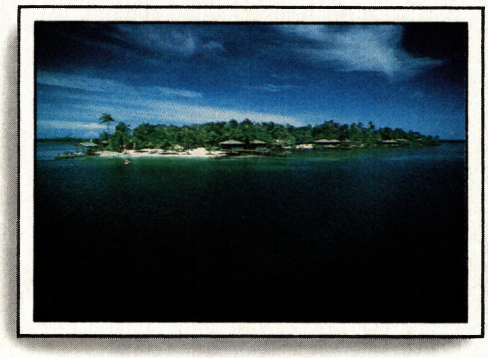
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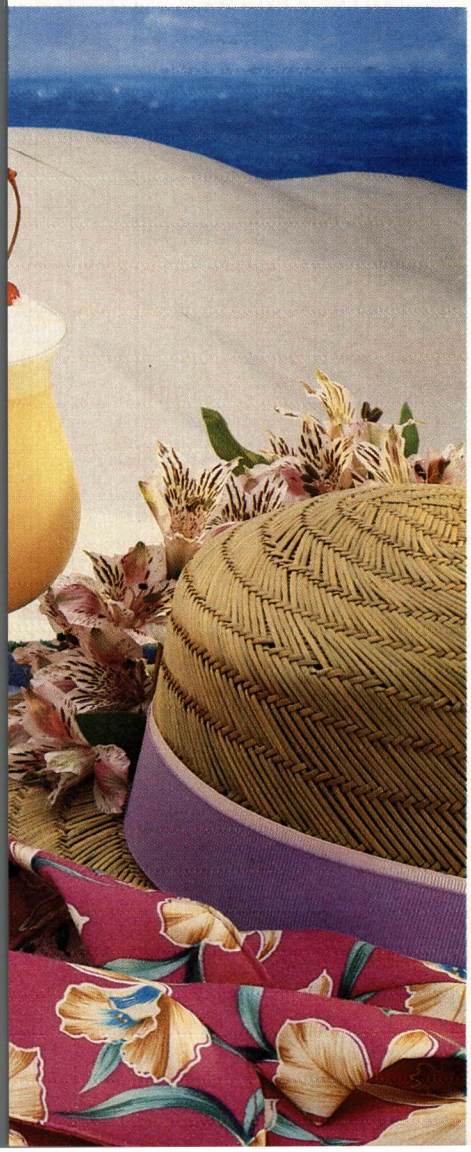
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Scuba Quiz

Category: Air Consumption

By Dennis Graver

This quiz covers knowledge ranging from entry ievei to that required to qualify as an instructor. The questions are progressively more difficult. See how well you understand air consumption by answering as many questions as you can without guessing. The answers are on the following page. Select the most correct answer for each question.

1. Air consumption calculations are:
- ☐ A. Necessary when a submersible pressure gauge is not being used
- ☐ B. Useful to gauge breathing rates
- ☐ C. Required for dive planning approximations
- ☐ D. Of no value if a submersible pressure gauge is being used

2. Air consumption:
- ☐ A. Increases as depth increases
- ☐ B. Decreases as depth increases
- ☐ C. Remains the same as depth increases
- ☐ D. Varies inversely with depth

3. The two greatest factors affecting air consumption are:
- ☐ A. Depth and breathing pattern
- ☐ B. Lung volume and physical fitness
- ☐ C. Depth and activity
- ☐ D. Lung volume and water temperature

4. Air consumption rates tend to be:
- ☐ A. Lower in women than in men
- ☐ B. Higher in new divers than in experienced divers
- ☐ C. Higher in colder water than in warmer water
- ☐ D. All of the above

5. The equipment needed to measure air consumption includes:
- ☐ A. Submersible pressure gauge
- ☐ B. Underwater timer and depth gauge
- ☐ C. Underwater slate and pencil
- ☐ D. All of the above

6. For a given air consumption rate, an 80 cu. ft. tank will last _____ times longer than a 50 cu. ft. tank.
- ☐ A. 1.6
- ☐ B. 1.5
- ☐ C. 0.6
- ☐ D. None of the above

7. Recommended techniques to reduce air consumption include:
- ☐ A. Relaxation and minimizing effort
- ☐ B. Holding each breath for a few seconds
- ☐ C. Slow, deep, continuous breathing
- ☐ D. A and C but not B

8. As a rule of thumb, 100 psi in a 71.2 cu. ft. steel tank equals about _____ cu. ft. of air at the surface.
- ☐ A. 2
- ☐ B. 2.5
- ☐ C. 3
- ☐ D. 3.5

9. Air consumption used to be calculated in _____; today it is most often calculated in _____.
- ☐ A. Cu. ft./min., psi/min.
- ☐ B. Psi/min., cu. ft./min.
- ☐ C. Psi/min., psi/min.
- ☐ D. Cu. ft./min., cu. ft./min.

10. The air consumption rate (at depth) for a diver with a 3,000 psi 50 cu. ft. tank who uses 300 psi in 10 minutes at a depth of 10 feet in the ocean is:
- ☐ A. 30 psi/min.
- ☐ B. 23 psi/min.
- ☐ C. 0.5 cu. ft./min.
- ☐ D. A or C but not B

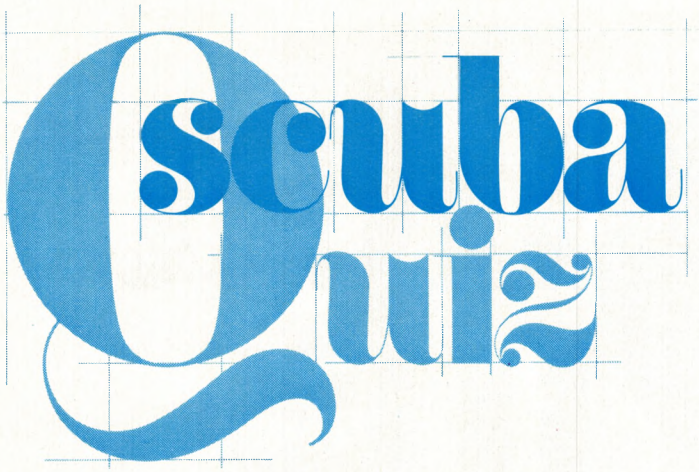
11. The Surface Use Rate (SUR) for the previous question is:
- ☐ A. 23 psi/min.
- ☐ B. 30 psi/min.
- ☐ C. 0.38 cu. ft./min.
- ☐ D. A or C but not B

12. The SUR of a diver who uses 1,100 psi of air in 22 minutes at a depth of 20 feet in fresh water is approximately:
- ☐ A. 31 psi/min.
- ☐ B. 55 psi/min.
- ☐ C. 88 psi/min.
- ☐ D. 22 psi/min.

13. A diver who uses 1,000 psi of air in 20 minutes at a depth of 33 feet in the ocean will need _____ psi of air for the same length of time at a depth of 90 feet if all factors remain the same except the depth.
- ☐ A. 1,925
- ☐ B. 1,865
- ☐ C. 1,805
- ☐ D. None of the above

14. A diver with a 3,000 psi 80 cu. ft. tank and an SUR of 30 psi/min. uses 160 psi to descend to a depth of 60 feet in the ocean, then remains there for 28 minutes. The diver then uses 100 psi of air to ascend. There will be _____ psi of air remaining in the tank when the diver surfaces from the dive.
- ☐ A. 388
- ☐ B. 396
- ☐ C. 516
- ☐ D. 542

15. If a diver with a 3,000 psi 80 cu. ft. tank uses 1 cu. ft. of air per minute at a depth of 25 feet in the ocean and starts a dive with a full tank, the diver will be able to remain at a depth of 80 feet in fresh water for _____ minutes if all factors remain the same except water density and depth, 200 psi is used for descent and 500 psi is reserved for the ascent.
- ☐ A. 65 min.
- ☐ B. 25 min.
- ☐ C. 32 min.
- ☐ D. 19 min.



Answers: Air Consumption

1. B. Useful to gauge breathing rates. Before submersible pressure gauges (SPGs), calculations were necessary. While calculations are useful for dive planning approximations, they are not required for recreational diving because of the gauge. Although the SPG simplifies the monitoring of air consumption, calculations are still useful to gauge the rate of usage for comparison to standard rates. This allows breathing rates and activity levels to be evaluated.

2. A. Increases as depth increases. Your regulator delivers air at ambient pressure. As pressure increases during descent, more air is supplied from your tank to maintain equilibrium in your air spaces. Usage varies directly with depth. Twice as much air (as on the surface) is consumed with each breath at 33 feet, three times as much at 66 feet, etc.

3. C. Depth and activity. The deeper you dive and the more energy you exert, the faster your air will be consumed. Air consumption is affected by many other factors, but none as great as these. To reduce air consumption, diving shallower and minimizing activity are the best actions to take.

4. D. All of the above. New divers use air about twice as fast as experienced divers. Cold water increases respiration, which—ironically—increases heat loss. Women divers have a definite advantage over men when it comes to air consumption.

5. D. All of the above. To measure air consumption, descend to depth, write down your starting time and SPG pressure, remain at a constant depth for a period of time, then write down your ending time and SPG pressure. Calculations are explained in other answers.

6. A. 1.6. Air consumption rates apply to a given size cylinder. If a tank of a different size is used, the duration of the supply from the new tank can be determined by means of conversion factors, which are simply ratios between the volumes of the two tank sizes (80/50 = 1.6)

7. D. A and C but not B. Proper breathing habits, relaxation and minimal efforts are all safe, effective ways to gain more time underwater by reducing air consumption. Holding each breath—known as skip breathing—leads to carbon dioxide build-up, could cause a lung injury and is strongly discouraged.

8. C. 3. 100 psi of air in a 71.2 cu. ft. tank equals 2.88 cu. ft. of air (X/100 = 71.2/2,475, 2,475X = 7,120, 7,120/2,475 = 2.88). An 80 cu. ft. aluminum tank equals 2 2/3 cu. ft. per 100 psi. These numbers are useful for some air consumption calculations as well as for buoyancy calculations for salvage operations.

9. A. Cu. ft./min., psi/min. Prior to SPGs, air consumption was calculated in cu. ft./min., but use of the gauges has caused the method to be changed to psi/min. because it is simpler and easier to calculate and use.

10. D. A or C but not B. This problem is solved in both psi/min. and cu. ft. per min. to familiarize you with each method. For psi/min., the Depth Use Rate (DUR) = Amount/Time = 300 psi/10 min. = 30 psi/min. For cu. ft./min., the diver used 300/3,000 psi or 10 percent of the air (5 cu. ft.) in 10 min., so the DUR = 5 cu. ft./10 min. = 0.5 cu. ft./min.

11. D. A or C but not B. The formula for Surface Use Rate (SUR) is DUR/(1 + D/33), where D = depth in seawater. For the SUR in psi/min., SUR = 30/(1 + 10/33) = 30/1.3 = 23 psi/min. For the SUR in cu. ft./min., SUR = 0.5/1.3 =0.38 cu. ft./min.

12. A. 31 psi/min. The DUR is 1,100 psi/22 min. = 50 psi/min. at 20 feet. Since the dive was in fresh water, the SUR becomes DUR/(1 + D/34). SUR is, therefore, 50/1.59 = 31.4 psi/min.

13. B. 1,865. The key to the question is an important rule in air consumption problems: Always convert the consumption to SUR before calculating the use rate for a new depth. This diver's DUR = 1,000/20 = 50 psi/min. SUR = 50/2 = 25 psi/min. DUR at 90 feet = SUR(1 + 90/33) = 25 X 3.73 = 93.25 psi/min. For 20 min. at 90 feet, the diver will need 93.25 X 20 = 1,865 psi of air.

14. A. 388 psi. We first determine the DUR, which is SUR(1 + 60/33) = 30 X 2.8 = 84 psi/min. This rate is multiplied times the duration of the dive (28 min.) to determine the amount of air used at depth (84 X 28 = 2,352). The air used at depth plus that used for descent and ascent are subtracted from the starting pressure to find that remaining at the end of the dive (3,000 - 2,352 - 160 - 100 = 388 psi).

15. C. 32 min. Begin by converting the 1 cu. ft./min. to psi/min. (1/X = 80/3,000 = 37.5 psi/min.). Next, convert DUR to SUR (37.5/1.76 = 21.3 psi/min.), then determine the DUR at 80 feet in fresh water (21.3 X 3.35= 71.36 psi/min.). Now determine the available air supply at depth (3,000 - 700 = 2,300 psi). Figure how long the 2,300 psi will last at a DUR of 71.36 psi/min. (2,300/71.36 = 32.2 min.). Problem can also be solved by calculating consumption in cu. ft./min.

Beginning divers should be able to determine their air consumption and should keep a record of it until it stabilizes. This helps in gauging proficiency and relaxation. Experienced divers probably have little need to make calculations, but highly experienced divers who engage in specialty activities need to be able to make estimates that require advanced and instructor level knowledge. I hope you did well for your level of training and that you can safely decrease your air consumption to enjoy the underwater world.

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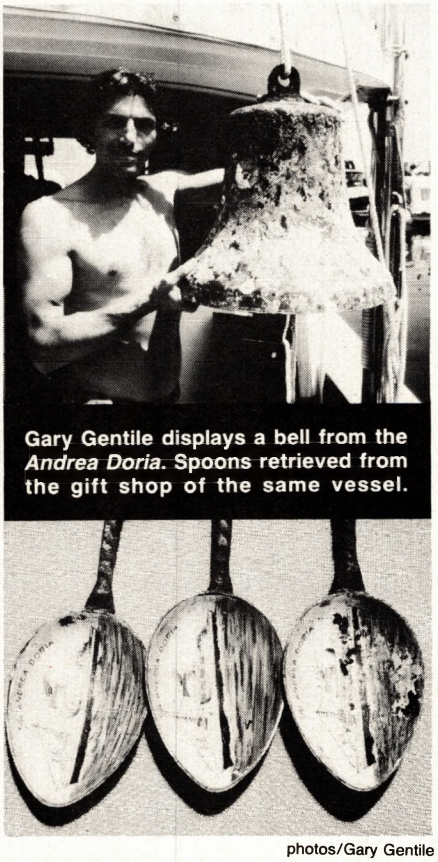
BY ELLSWORTH BOYD

Mike Schabeck, Toledo, Ohio, has been diving since 1958 and is president of the Toledo Sub-Mariners Scuba Club—the oldest club in Ohio—founded in 1952. But more important, Mike is now my official "chart expert." I have shipwreck resource authorities throughout the United States and several foreign countries who help me locate elusive wrecks, but I desperately needed a chart specialist. Mike is not only a highly qualified specialist, but also an award winner and veteran of cooperative charting.

Mike writes: "As a member of the United States Power Squadron, I work with the National Ocean Survey (NOAA) on a volunteer basis, updating nautical charts. Since I am a diver, I have a keen interest in wrecks and having them placed on charts or taken off if they have been removed from the bottom." Mike gives two examples of co-op charting: "The new chart of Saginaw Bay, Michigan, shows the Coast Guard Station on the wrong side of the river. The station was moved three years ago but that was never reported. A wreck in Lake Erie that sank in 1854 rests 110 yards offshore in 12 feet of water, the boiler only three feet below the surface. Many boatmen have hit the boiler, but the wreck was never reported." Thanks to Mike and others who are devoted to co-op charting, we have our charts continually updated.

Divers might be interested in ordering a free copy of: Dates of Latest Editions of Nautical Charts and Miscellaneous Maps, (issued quarterly) from: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service N/CG33, Riverdale, MD 20737. Approximately 25 pages, the booklet gives chart and map locations, numbers and prices. It also gives a special mail order address for its distribution branch in Riverdale. If you want to contact Mike Schabeck, write: 2113 Mansfield, Toledo, OH 43613.

Many divers responded to my request for information on wrecks off Guam, Mariana Islands. Special thanks to Paul Edwards, Larry Anders, Ronald Williams, Rich Greatting, Robert Coulter, Keven Gibson, Tom Walker, Jim Brandt and Edouard Blais. Apra Harbor is a favorite dive site off Guam, particularly the wreck of the *Cormoran*. This 330 foot German merchant vessel was scuttled in 1917 prior to United States involvement in World War I. It rests 80 to 130 feet deep with visibility varying from 20 to 50 feet. About 75 feet from the *Cormoran* lies the *Tokai Maru*, a 450 foot Japanese freighter-passenger liner that was torpedoed in 1943. It is 80 to 130 feet deep and can be explored on the same dive with the *Cormoran*. Another Japanese ship, the 270 foot freighter, *Kisogawa Maru*—torpedoed in 1944—sits on the bottom as if it were still sailing the seas. It is 110 feet to her deck and 160 feet to the bottom. A small gun is mounted on her bow. There's an American tanker in the harbor, name unknown, approximately 350 feet long. Built from ferroconcrete, the ship was towed like a barge, carrying lumber and fresh water before she was scuttled in 1946. It is 40 feet to the top of the wheelhouse, 60 to the deck and 100 feet to the bottom.



Gary Gentile displays a bell from the *Andrea Doria*. Spoons retrieved from the gift shop of the same vessel.

photos/Gary Gentile

Apra Harbor is refuge for several airplanes as well as ships. A Japanese dive bomber, broken into three pieces, sits on its nose 50 to 80 feet deep. The fuselage points toward the surface, but the tail is missing. A Japanese seaplane, 70 to 100 feet deep, plants its pontoons and wings parallel to the bottom, its tail intact, sticking up behind the craft.

Visibility outside the harbor often reaches 100 feet. The bottom drops off fast around Guam, which is 120 miles from the Mariana Trench, with the greatest known depth of any ocean—36,198 feet. The Micronesia Area Research Center at the University of Guam has newspapers and books on local wrecks. The Guam Maritime Museum, Agat, Guam, has shipwreck artifacts and memorabilia. For more information on Guam, write to: Paul Edwards, P.O. Box 20165 GMF, Guam, Mariana Islands 96921.

Charles Cole, Newfield, New Jersey, is only 15 years old, but he made an interesting find on the *City of Athens*, a wreck East Coast divers have been exploring for years. He found a Butterick Fashions Pattern Catalogue published by W.E. Pierce Mercantile Company in 1918. "It's great to find something this old," Cole said, "but paper was the last thing I expected to see underwater." Cole is slowly preserving and separating the pages, which are remarkably clear and readable for having been submerged for over 67 years. The *City of Athens*, a 3,648 ton steamship, sank in 1918 when she collided with the cruiser, *La Glorie*, off Atlantic City, NJ. Sixty-six lives were lost.

Nobody has found the Loch Ness monster, but Joe Zarzynski, Wilton, New York, says divers finally brought up a World War II Wellington bomber. The plane, which crash-landed in Loch Ness, Hogmanay, Scotland, 1940, was salvaged successfully during a two-week dive operation. The plane will be taken to the headquarters of British Aerospace, Weybridge, Surrey, where it will be restored. Donations to help restoration of the Loch Ness Wellington may be sent to: Morag Barton, Coordinator, Brooklands Museum, Weybridge, Surrey, England.

Mike Powell, Lansing, Michigan, is chairman of the Tenth Annual Divers' Showcase, sponsored by the Michigan Capitol City Dive Club. The Showcase, scheduled for March 1, will feature Great Lakes wreck diving. For details call Mike: (517) 487-0060.

March 1 is also the last day for divers to visit a shipwreck artifacts exhibit at Abington Art Center near Philadelphia. Scott Jenkins has a *Moonstone* display, Gary Gentile has *Andrea Doria* finds and Robert Leahy is exhibiting his collection of underwater prints. Admission is free. For further details call (215) 887-4882.

Point Barrow is as far north as you can go in the great state of Alaska. That's

(Continued on Page 22)

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Photos by LARRY CUSHMAN

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Diving Medicine

BY ALFRED A. BOVE, M.D., Ph.D.

WATER

In many ways, water is the bane of sport diving. After all, if we did not have water between us land dwellers and the shipwrecks, coral reefs, fish, lobsters and other goodies on the seafloor, we would not need all the equipment we are obliged to wear when we sink beneath the surface for a few hours. But we live on the Water Planet, and in spite of our inability to breath water, nearly everything about it is to our benefit.

We do not consider water our friend when it falls on our picnic, sinks a ship or floods a city, but we are made up of water (about 62 percent); all of the life processes that go on in our bodies occur in a pool of saltwater. It is as though we wrapped a small sea pond inside our skin and put all the functioning cells into it to perform their multiplicity of duties, which collectively we call living.

There is an enormous amount of water on the earth. Our planet's surface is 70 percent water. The amount is estimated to be one-third of a billion cubic miles, or about six sextillion eight ounce glasses of water. Most of the water (97 percent) is in the ocean.

WEIGHT AND PRESSURE

Water weighs about eight pounds per gallon, which converts into the better known 62.5 pounds per cubic foot. Seawater contains about one and one-half pounds of minerals and, therefore, weighs about 64 pounds per cubic foot. The difference means the buoyant force keeping us afloat is 2.5 percent greater in seawater and we need 2.5 percent more weight to remain at neutral buoyancy when we move from fresh to seawater diving. The weight of water also gives us the pressure we experience on descent. A column of seawater 33 feet high and one square inch across weighs 14.7 pounds; each 33 feet deeper we dive, the pressure increases by 14.7 pounds per square inch.

MINERAL CONTENT

The water in our bodies contains a carefully balanced supply of minerals that are regulated to allow cells to function normally. Although seawater is similar in composition to the water in our bodies, there are some critical differences that make seawater dangerous to drink. Most important, seawater is about three times more concentrated than water in the body. Our bodies can accept water we drink with higher mineral concentration than that in our bodies, but the excess minerals must be removed by the kidneys, which need water to excrete the minerals. The net result is progressive water loss and dehydration when seawater is ingested. A more important problem with drinking seawater is the excess of certain minerals that cause vomiting and diarrhea. The worst culprit is magnesium. When you get a few gulps of seawater, you may get an upset stomach, but with prolonged seawater drinking, serious dehydration owing to vomiting and diarrhea will result. Mariners stranded at sea cannot survive by drinking seawater. When you are diving, avoid swallowing large amounts of seawater.

Swallowing fresh water you are diving in also has hazards. Contamination with bacteria and toxic chemicals is becoming more common. Swallowed contaminants or bacteria can also produce illness.

The minerals in seawater will remain in your diving gear after the water evaporates and corrode and block regulators, BCs, wetsuit zippers and other equipment. It is important to rinse your gear in fresh water before allowing it to dry. Special attention is needed if you make one or two dive trips a year. Your gear must be thoroughly rinsed to remove all traces of seawater before storage between trips. Storage problems after freshwater diving involve retention of bacteria and fungus from the water. These can contaminate the equipment and remain until the next dive. Severe lung infections have occurred from bacteria and fungus growing in regulator mouthpieces. Fresh water rinsing is necessary for your gear regardless of where you were diving.

HOT AND COLD WATER

Water temperature is one of the environmental factors that must be respected in all diving. In Minnesota (yes, we dive in Minnesota!), the water is cold enough year-round to require full protection from heat loss. Drysuits have made diving in northern latitudes comfortable. A good wetsuit or drysuit will provide protection in most northern waters. Water varies in density with temperature. The highest density occurs at about 38°F, so you will find water at that temperature at the deepest part of a lake or bay. Because of the varying water density, water of different temperatures will form layers (ther-

(Continued on Page 74)

Earth's surface (seen from the moon) is 70 percent water; the human body 62 percent.



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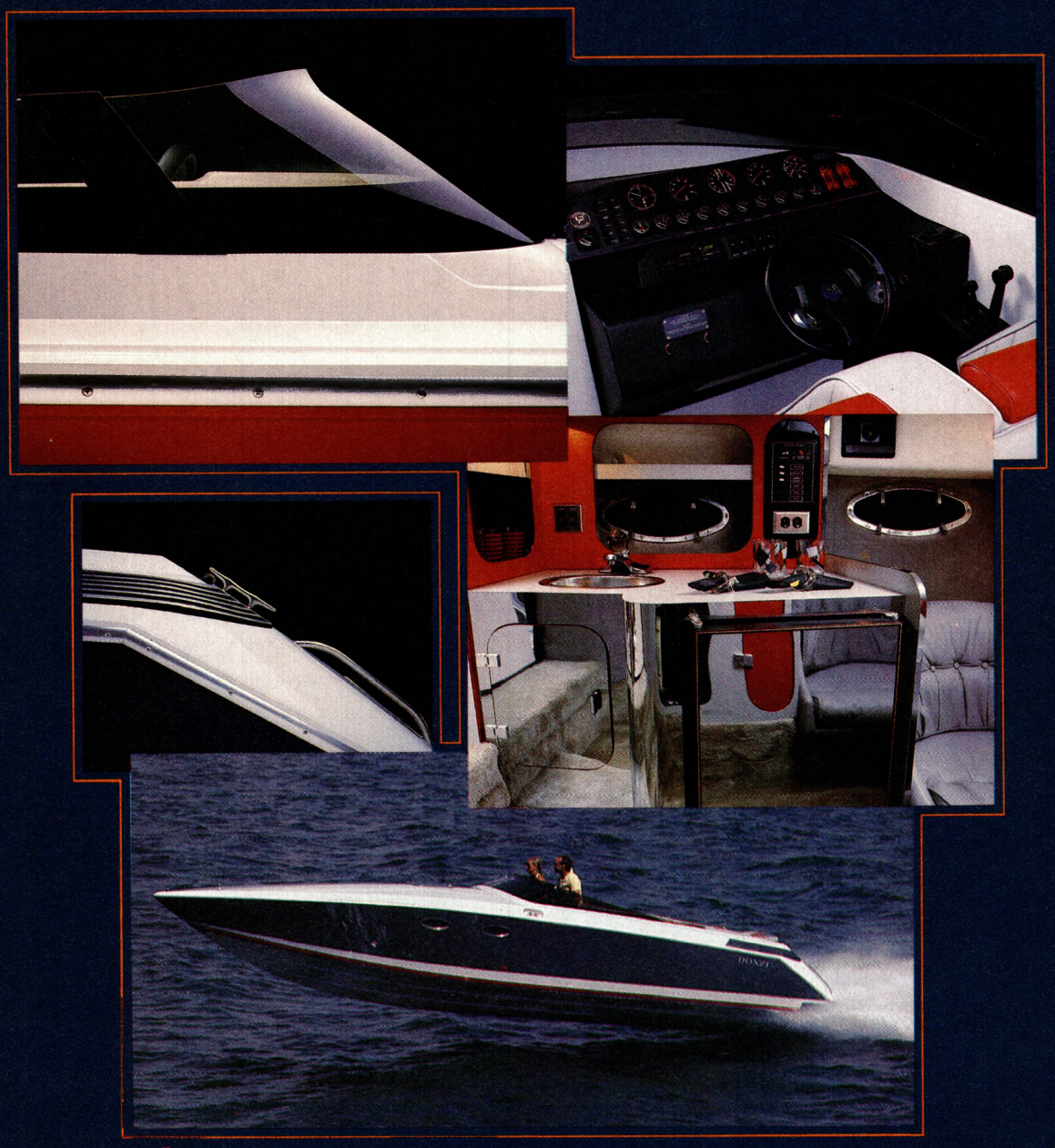
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*Entry forms and contest rules available at participating Aqua-Lung Pro-Line Dealers. Entrants must be either a certified diver or a student enrolled in a diving class. Contest ends June 30, 1986. Void where prohibited by law.

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Diver's Calendar

DIVERS' SHOWCASE

The Tenth Annual Divers' Showcase, sponsored by the Michigan Capitol City Dive Club, will be held **March 1** in Lansing, Michigan. The event will feature Great Lakes wreck diving. For information contact Mike Powel in Lansing (517) 487-0060.

BOSTON ACTIVITIES

Three important events will occur **March 1** in Boston, Massachusetts:

The Boston Diving Show will be held at the Park Plaza Hotel, 10:00 am to 5:00 pm. The event will include daytime seminars and equipment exhibits.

The Underwater Film Review will be held at John Hancock Hall at 8:00 pm. Jack McKenney's Dive to Adventure program will be featured.

Professional Scuba Inspection's Visual Cylinder Inspector (VCI) training course will also be held at the Park Plaza Hotel.

For information contact: Fred Calhoun, P.O. Box 291, Back Bay Annex, Boston, Massachusetts 02117.

DAN COURSE

The Divers Alert Network (DAN) is offering a diving accident and hyperbaric oxygen treatment course **March 6-8** at Duke University's F.G. Hall Hyperbaric Laboratory. The course is offered for health care workers and instructors.

For more information contact Cindi Easterling, P.O. Box 3108, Duke University Medical Center, Durham, NC 27710; (919) 684-6878.

BOSTON SEA ROVERS CLINIC

Boston Sea Rovers '86, the 32nd annual underwater clinic, will be held in Boston on **March 8**. The daytime program, featuring exhibits and seminars on all aspects of diving, will occur from 9:30 am—4:00 pm at the Copley Plaza. The nighttime program, 8:00—11:00 pm will be held at John Hancock Hall. Films by Joe MacInnis, Stan Waterman and Bob Ballard will be shown, followed by a meet the speaker party.

For information contact: Boston Sea Rovers, P.O. Box 717, Westwood, Massachusetts 02090 or Bunky Hodge (617) 878-8710.

UNDERWATER IRELAND '86

Underwater Ireland '86, the sixth annual conference and exhibition of sport and research diving will be held **March 8-9** at the Grand Hotel, Dublin, Ireland. Conference details are available from the Irish Underwater Council, 60, Lower Baggot Street, Dublin, Ireland.

DIVER FLEA MARKET

The First Annual Sport Diver Flea Market, sponsored by T.J. Sport Divers of Waynesville, Ohio, will be held **March 16** at Kings Island Inn off IS71, exit 25, Kings Mills, Ohio. A raffle will benefit DAN.

For information contact Timothy Patton, 7562 Townshipline, Waynesville, Ohio 45068.

BENEATH THE SEA

Beneath the Sea, the greater New York underwater film festival and exposition, will be held **March 21-22** at the Marriott Hotel, Tarrytown, New York. Stan Waterman will be the MC.

For information write BTS '86, P.O. Box 644, Rye, New York 10580 or call Armand Zigahn (914) 961-2088.

CHOCOLATE ABALONE DIVE

The second annual California Chocolate Abalone Dive will be held in Monterey Bay **March 22**. Divers will retrieve six inch chocolate abs from underwater and each ab will have a number inside corresponding to a prize. For information contact Al Huelga, Aquarius Dive Shop, 2240 Del Monte Ave., Monterey, CA 93940; (408) 375-1933.

UPS PHOTO CONTEST

The deadline for entries in the International Underwater Photographic Competition, sponsored by the Northern California Chapter of the Underwater Photographic Society, is **March 25**.

For information contact Don McMahan, P.O. Box 9001, Pleasanton, CA 94566; (415) 846-0337.

WATERMAN/MCKENNEY/IL

On Saturday, **March 29** seven Illinois dive stores will host a film presentation featuring both Stan Waterman and Jack McKenney at the Hyatt Oak Brook in Oak Brook. A reception will follow. For information contact any of the stores: Black Magic Dive Shop of Round Lake Park, Chicago Scuba Shop, Midwest Diving Academy of Hoffman Estates, Scuba Emporium of Alsip, Scuba Systems of Skokie, The Gear Bag of Chicago and Underseas Scuba Center of Villa Park.

CAVE DIVING COURSE

The National Association for Cave Diving will present a cave and cavern diving orientation course for advanced divers and instructors **March 29-30** at Manatee and Ginnie Springs in Florida. For information contact NACD General Manager, P.O. Box 14492, Gainesville, FL 32604 or call Steve Gerrard (904) 656-1223 (after 5:00 pm ET).

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Some hard talk about a soft jacket.

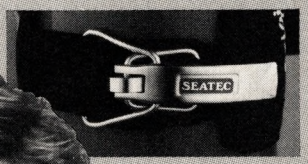
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WRECK FACTS

(Continued from Page 16)

where diver Chris Vanosdol is trying to trace the remains of 30 wrecks of an 1871 whaling fleet, all trapped in the ice and lost at the same time. He is also trying to gather information on the *Orca*, a steam whaler caught and crushed in the ice in 1897. Clues as to the locations of the 1871 whaling fleet and the *Orca* would be appreciated. Write to Chris: P.O. Box 595, Barrow, Alaska 99723.

Washington State divers might be interested in *Ships of the Inland Sea—The Story of the Puget Sound Steamboats*, by Gordon R. Newell. This is not a shipwreck book; it is a record of the ships and men who made the Puget Sound an integral part of early American history. The 241 page hardback relates tales of sidewheelers, sternwheelers, tugs, ferries and fast express steamers from 1835 to 1960. It is $8.95 plus postage from: Polly Gardenier, Binford and Mort Publishers, 1202 NW 17th Avenue, Portland, OR 97209.

Marty Meylach, author of the classic treasure book, *Diving to a Flash of Gold*, will be setting up an exhibit as part of the Fifth Annual Palm Beach, Florida International Boat Show at the Riveria Beach Municipal Marina, March 20-24. Meylach's display will be a sunken treasure spectacular on a stage 40 feet long by 20 feet wide. Divers who have coins, artifacts or treasure related materials are invited to participate in the display. Contact: Marty Meylach, 10380 SW 111th St., Miami, FL 33176; (305) 271-0372.

Safe diving to all. Be sure to include a stamped, self-addressed envelope when writing: Ellsworth Boyd, 1120 Bernoudy Rd., White Hall, MD 21161.

TOLEDO SUBMARINERS

The Toledo Submariners dive club, founded and incorporated in 1952, makes dives in Florida, North Carolina, Canada, the Great Lakes, Ohio lakes, rivers and quarries. The club hosts an U/W pumpkin carving contest each year as well as an underwater Easter egg hunt.

Divers wishing more information should contact Mike Schabeck, 2113 Mansfield, Toledo, Ohio 43613.

BEUCHAT

In order to accommodate the numerous new products unveiled at DEMA (complete range of Contact fins, Diva masks, pressure and depth gauges, regulators, BCs), Beuchat-USA has doubled its warehouse space in Fort Lauderdale, Florida. The company has also added corporate offices at 408 South Andrews Ave., Suite 202, Fort Lauderdale, FL 33301; (800) 248-0005. Beuchat is now seeking nationwide distribution and offers packages to dealers.

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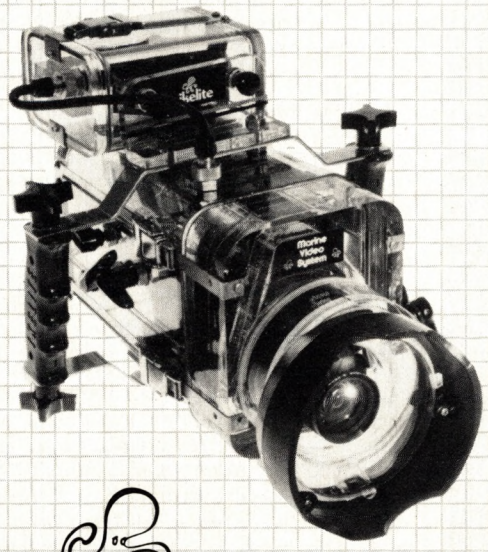
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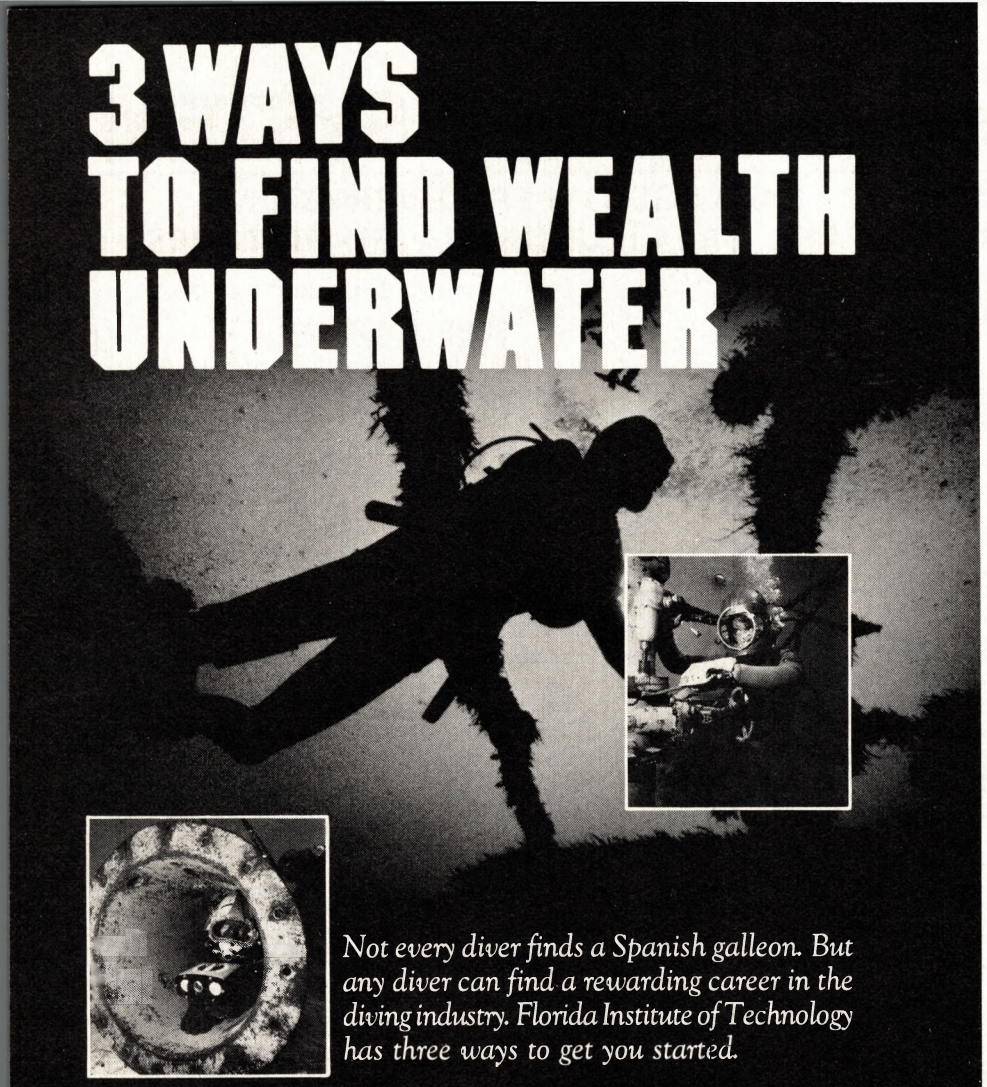
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EDITORIAL

(Continued from Page 8)

How can the dive industry cope with these problems? It won't be easy, but there are things that can be done:

1) Mail order advertisers of scuba equipment and other related life-support systems must make every effort to prevent equipment from falling into the hands of the uninformed and untrained. Mail order purchasers should be carefully screened for certification or other proof of training. Each mail order shipment should contain warnings that the equipment is not to be used without proper training. It is in the best interest of the mail order seller to ensure the equipment is not involved in a dive accident.

2) The dive industry must find ways of warning purchasers of used equipment that they should take training before attempting to use the gear. Perhaps the training associations could launch a campaign to educate the consumer on the need for training before using new or used gear. This sort of publicity could be further supported by posting signs in local dive shops and circulating warning posters to YMCAs, community centers, boys' clubs and other public facilities with pools. Very possibly DEMA might want to step in and support further publicity with news releases and announcements circulated to various newspapers and magazines throughout the U.S.

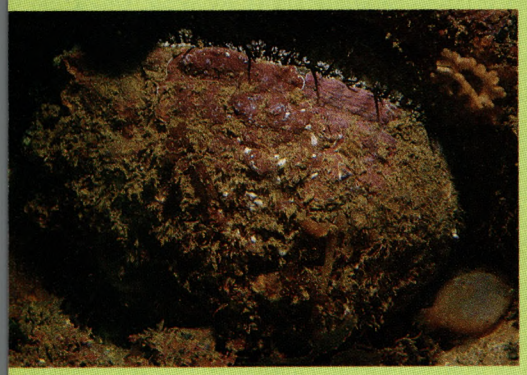
3) We must also find a way to convince certified divers that they should not attempt scuba training unless they are certified instructors. A casual approach to training can result in disaster. No matter how easy scuba may seem, the business of teaching it is a very exact science. Once again, the training associations can play a crucial role in getting this message across to classes.

REGULATOR CLEANSING SOLUTION

Miami-based Lawrence Factor, Inc. is marketing a new regulator cleaner. The USDA approved cleaner is safe for use with all brass/bronze, stainless steel and chrome plated metals and will not affect rubber, so regulators may be immersed before disassembly. It will effectively remove salt, corrosion, dirt, silicone grease and most other soil without the need for scraping. Supplied in concentrate form it can be diluted with tap water and used by itself or with heat and ultrasound.

For information concerning LFW Regulator Cleaner or other L-Factor products, contact Lawrence Factor, Inc., 285 NE 185th Street, Miami, FL 33179; (305) 652-5998.


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ABALONE From Burgers To Exotic International Fare

TEXT AND PHOTOGRAPHY BY BONNIE J. CARDONE

My guest had his fork halfway to his mouth when he asked me, "Just how do you catch this abalone fish?" He was a non diver, born and raised in the East. When I invited him to my house for an abalone dinner, he accepted enthusiastically, knowing abalone was a delicacy that cost a bundle when ordered in a restaurant. It was now apparent that was *all* he knew about abalone.

While he awaited my answer, my guest's fork remained poised in mid-air. "Actually," I said slowly, willing his fork forward, "abalone is a snail. We find them on rocks and pop 'em off with a special tool." His face blanched, but owing to his strict upbringing, he guided his fork into his mouth and swallowed his first bite of underwater snail. It was tender, tasty and unlike the *escargot* he found totally unpalatable. He smiled, his face regained its normal coloring and I breathed a sigh of relief!

Abalone belong to the phylum Mollusca, class Gastropoda, family Haliotidae. They are still fairly common in California waters and, without a doubt, are one of the easiest seafoods to capture. This is because they are sedentary, spending most, if not all, of their adult lives in one spot. When predators approach, the abalone's only defense is its ability to clamp down on its scar with a good deal of suction power.

According to law, California divers intent on taking abalone need three things: an ocean fishing license; a caliper type measuring device; and an abalone iron that meets certain specifications. For instance, the iron must have rounded edges. This is because abalone are hemophiliacs; they can bleed to death from the slightest cut. Because of this, tools with sharp edges should never be used. Also, when prying an ab off a rock, insert your iron under the animal as far as possible, then pull up on it: Pushing down could force the iron into the animal's underside and injure it.

By law, abs must be measured underwater and, if short, immediately replaced on the rocks from which they were detached. You may not bring shorts ashore or aboard a boat. Only free divers may take abalone north of Point Conception; south of this scuba may be used. In Southern California, abalone season runs from March 16 to January 14; in Northern California it is open during April, May, June, August, September, October and November. Some areas of the coast and off Catalina have been totally closed to the collection of abalone—check your fish and game rules for details. You may take only four abalone per day and, once you have your limit you may not take any more—even if you find one larger! You must learn to identify the various species of this shellfish because the minimum legal size for each is different: Reds must be seven inches at their widest point; greens, pinks and whites, six; blacks, five; and all other species (there are hybrids), four.

Of the five major West Ccast species of this succulent shellfish, reds are prized because they are the largest and provide the most meat. Whites are considered the tenderest and are the rarest. They are also found in the deepest water. Pinks are

RECIPES

ABALONE BURGERS

Abalone
1 egg, beaten
Onion, finely chopped
Parsley, chopped
Oregano
Basil
Salt and pepper
Seasoned bread crumbs

Cut abalone into large chunks and put through meat grinder. Mix ground abalone and rest of ingredients until well blended. Form into patties. These may be fried, baked or microwaved until just cooked through. In a microwave, on high, this takes about 2½ minutes. Serve on a bun with lettuce and tomato.

ABALONE RELLENOS

Abalone steaks
1 C beer
1 egg, beaten
Seasoned cracker or bread crumbs
Spaghetti sauce
Cheese, grated
Green chiles, diced

Slice abalone into steaks horizontally. Pound each steak with a meat hammer until it resembles lace. Combine egg and beer. Dip the steaks in this mixture, then coat with crumbs. Near the edge of each steak place a spoonful of diced chiles. Top with a little grated cheese, then some spaghetti sauce. Roll the steak up and secure it with toothpicks. Fry in a covered pan in a little oil, rolling frequently so all sides cook. This will take about three minutes totally. Drain on paper towel. If cooked in very little oil in a nonstick frying pan and drained well, these can be made ahead of time, refrigerated, then reheated later for a minute or two in a microwave oven without any deterioration in taste. Garnish with more green chiles and grated cheese. These are great as an hors d'oeuvre or as an entree.

quite tender; greens and blacks are much tougher. Blacks are found shallow—they may even be out of the water during low tide. Greens have the prettiest shells.

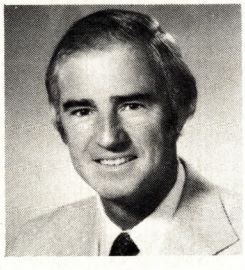
It takes an ab about ten years to reach legal size and its life expectancy is about 20 years. Man is not the abalone's sole predator: This gastropod is eagerly eaten by sea otters, rays, crabs, octopus, starfish, sheephead and cabezon.

Cleaning abalone takes a little practice, but is not hard to learn. To pop the animal out of its shell simply insert a wooden spoon between the animal and the shell. Then, make a V-shaped cut at the mouth and remove it and the viscera, found in a sack that encircles the top of the animal. Trim off the short tentacles around the foot and the sole of the foot.

Because abalone has a such a mild flavor, it can be used in many different recipes. Two are found in the sidebars. Last year, abalone was selling for $30 per pound. Thus, an abalone feast should be quite a treat for your non diver friends—just make sure they know it's snail they'll be eating when you invite them over!

DIVE TRAVEL BOOK

A new book by author/photographer Carl Roessler offers divers a comprehen-



sive view of the world's greatest diving. *The Coral Kingdoms* takes you on a trip around the world under the sea. Roessler's text and photography show what makes each great reef unique. From the Caribbean to the Red Sea, from the Galapagos to Thailand, this new book is invaluable to divers considering travel to the exotic dive areas of the world.

Visit your bookstore or write to See & Sea Travel, Inc., 680 Beach Street, Suite 340 Wharfside, San Francisco, CA 94109; (415) 771-0077.

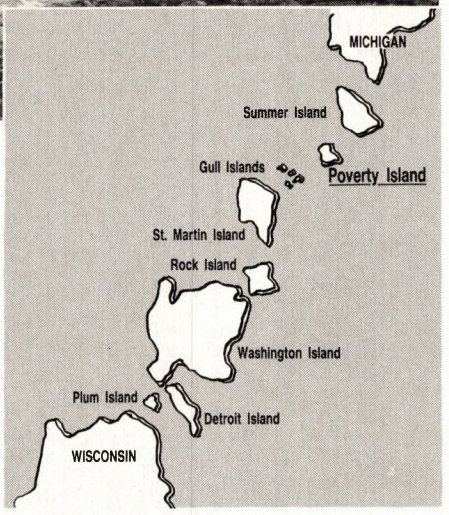
SPORT CHALET

Sport Chalet Divers, a Southern California retail-training facility, has just opened it's fourth store in Escondido, San Diego County. The new 8,000 square foot outlet features a full line of name brand diving equipment as well as rental gear, repairs and 70 boat trips a year. Dive adventures to Cayman Brac, St. Lucia, Sea of Cortez and Cozumel are planned for 1986.

The Escondido facility offers PADI diving instruction from the open water level to advanced and specialty ratings. It is managed by Tom Clattenberg.







Five Chests Of Gold Respark Interest In

The Treasure Of Poverty Island

TEXT AND PHOTOGRAPHY BY BILL BARADA

The Treasure of Poverty Island was first published 16 years ago (SKIN DIVER, March 1969) and the story stirred up a worldwide storm of interest among treasure hunters. Arthur Reetz, the veteran wreck diver who told me the story, was deluged with letters and phone calls and the water around Poverty Island was swarming with divers for years after it was published. Recently, Reetz phoned to tell me of some new discoveries and events that have once again triggered interest in the story.

For those not familiar with the facts, Poverty is one of a string of islands north of the Door County Peninsula near the town of Escanaba, Michigan. This is one of the most treacherous and unpredictable stretches of water in all the Great Lakes. Large shoal areas around the islands make navigation so risky the passage is rarely used by modern steamships. Giant waves generated by unseen storms many miles away can cause ships to crash into the shallow shoals. But during the days of sailing ships Poverty Passage was a primary shipping lane and, with no foghorns or buoys to mark the channel, the shoals collected sailing vessels by the hundreds, with as many as ten ships piled on the rocks in the same day. Thus, the area is literally a graveyard of sunken ships.

But the Poverty Island treasure is not inside a sunken ship. It is five separate chests of gold bullion that were chained together and thrown overboard to prevent their capture by enemy raiders during the American Civil War. The treasure, valued at $4-$5 million at that time, would be worth about $100 million today.

The story was pieced together by Reetz from thousands of hours of meticulous research in archives, library records and old newspaper stories. Personal interviews with descendants of old-timers give vivid accounts of shipwrecks, groundings and sinkings.

It began in 1863 when the Port of Escanaba was a thriving embarkation point for sailing ships carrying supplies to both sides in the Civil War. The legend is that an unknown foreign power was trying to buy favor with both factions of the war by financing them with shipments of gold bullion. Canadian raiders learned of these shipments and attacked the treasure ship near Poverty Island. According to legend, the crew was killed and the vessel burned; but before the ship sank, five chests of solid gold bars were chained together and thrown overboard. It is believed that the chains were intended to help locate and recover the chests at a later date.

Little attention was paid to the story until it surfaced again in the 1930s. A ship was stranded on Poverty Shoals and the crew tried to pull it off by dropping an anchor in deep water and winching it in. During one try the anchor came up with a chain and a chest hooked on one of its flukes. The chest slipped off and disappeared, but the entire crew witnessed the incident and their stories brought the Poverty Island treasure legend to life. The search for it began in earnest and has continued ever since.

A major search was conducted in 1936 when a syndicate financed a team of commercial divers who had a diving bell. This project ended three years later when a storm drove their ship on the rocks. Years later the rusting diving bell could be seen resting on the bottom.

But the diving bell story did not end with the loss of the ship. It was kept alive by a man named Karly, whose father was keeper of the lighthouse on Poverty Island during the Civil War. Reetz interviewed Karly in 1968 when he was a tavern owner on Washington Island and Karly told him that, when he was a boy, he used to play around the lighthouse and watch the diving treasure hunters from shore. He told Reetz that one day when the diving bell surfaced, all four men went into ecstatic dances all over the deck. Karly said the celebration lasted all day and he could hear the men's shouts. He is certain the divers found something valuable, but that night a sudden storm smashed their ship on the rocks and the men were lucky to escape with their lives. All their equipment was destroyed and the men disappeared.



Poverty is one of a string of islands in Lake Michigan north of Door Peninsula, Wisconsin. The Poverty Island treasure is five chests of gold bullion that legend holds were thrown into the water during the Civil War. Top left: When Joe Guptill's boat wrecked on Poverty Island, Art Reetz and his party were stranded for five days. Above: A shallow Lake Michigan wreck.

This is the story of the Poverty Island treasure that has kept the legend alive through the years. Reetz has spent thousands of hours diving off the island and has pinpointed the locations of dozens of interesting wrecks, but he has never found any part of the lost treasure. Some recent developments have renewed his interest, however, and last January he phoned to tell me about them. The two most interesting of these are:

1. A friend of his searched the area for two years with modern, sophisticated equipment such as sidescan sonar, magnetometers, etc., and came up with

some readings that Reetz calls "exciting." This friend recovered an ancient cannon in 1983 that was manufactured in 1850 and, to Reetz's knowledge, is the first recovered from the Great Lakes.

2. Even more intriguing is the story of another serious treasure diver named Moissi who searched the area off Poverty Island for two years. Moissi told Eldred Ellison, who owned the Washington Island marina, that he had recovered one of the chests and had hooked a second that came loose before it could be landed, so only its straps were recovered.

Then, for some unknown reason, Moissi stopped searching and refused to divulge any details regarding his search or the treasure. However, Ellison reports that Moissi offered full cooperation to anyone who would cut him in on a fair portion of any gold recovered.

Local divers and residents considered Moissi's account as just another cock-and-bull story, until he suddenly turned



photo/Art Reetz

Shipwrecked divers (from left) Jack Whittington, Bernie Ward, Art Reetz, Rikki Reetz, Jim Ward and Vince Palella. Sudden storms and a lack of sheltered anchorages in the area of Poverty island have ended many treasure expeditions abruptly.

up as the owner of a full-fledged, thriving construction company in Hawaii.

These developments have presented a series of intriguing questions and a lot of speculation, such as:

Why did Moissi suddenly stop searching if he had recovered only one of the five chests of gold?

Where did he suddenly get the money to finance a construction company and its expensive equipment?

Perhaps Moissi did not report his treasure find to the Internal Revenue Service and is avoiding income taxes. He might even have recovered all the gold and is not reporting any of it.

Perhaps he quit searching because the other four chests have disintegrated and scattered the gold bars over the bottom.

Perhaps he didn't find any treasure at all, but found an "angel" to finance his construction venture.

Perhaps all the Poverty Island treasure stories are nothing more than figments of vivid imaginations.

At any rate, no matter which of these theories is correct, the story has created a tremendous resurge of interest in the treasure of Poverty Island.

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DACOR CATALOGUE

Dacor's catalogue for 1986 has a new look, a golden look. The company calls it Going for the Gold. It all started last July when Mel Fisher's treasure divers found the priceless cargo of the *Nuestra Senora de Atocha* on the bottom of the Atlantic Ocean near Key West. Treasure Salvors has been using Dacor equipment for years and invited the company to visit the treasure site. The results are shown in photos covering the first four pages of the new catalogue.

Sam Davison, Dacor president, and a long-time friend of Fisher's (Mel was once a Dacor dealer in California) ran the



Mel Fisher (seated left) takes an artifact while Sam Davison examines a gold bar.

41 foot company boat from its home base in Marathon to the dive site 40 miles west of Key West. There, along with other Dacor divers, he was able to view firsthand the final resting place of the Spanish galleon, which sank in a hurricane more than 360 years ago.

Some of the recovered treasure items are shown in the new Dacor catalog, along with photos of the dive site and Fisher's Key West museum.

CHAMP

Is 109 mile long Lake Champlain the habitat of a colony of 15-25 foot long Loch Ness-like mystery animals? Recent evidence indicates this might be true! "There were 14 reported sightings of Champ in 1985," announced Joseph W. Zarzynski, director of the Lake Champlain Phenomena Investigation. Zarzynski has been cataloguing sightings of Champ since 1974 and he says that during his decade of cryptozoological work he has collected more than 250 reported Champ sightings—many dating back to the 19th century.

Zarzynski's research team completed 31 days of field work at Lake Champlain in 1985 searching for Champ using camera surveillance, sonar and scuba monitoring.

Zarzynski's book, *Champ—Beyond the Legend*, can be purchased mail order from: M-Z Information, P.O. Box 2129, Wilton, NY 12866; $8.95 softcover, $16.95 hardcover. Add $1.25 postage and handling. NYS residents also add seven percent sales tax.

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Each rod is covered by the company's full one-year money-back guarantee. There is a limit of two (2) rods per address at this price. But if your order is mailed early enough (before May 25) you may request up to five. These Famous Nationally Advertised SWIFT-660/F Telescoping WhisperCast WhamRods will *not* be sold at this price by the company in any store.

To order, mail this *original* printed ad (no copies or photostats) together with your name and address and $5 for each rod. Add only $2 shipping and handling no matter how many rods you are requesting. (New York residents add sales tax.) Allow up to 6-8 weeks for shipment. *Make check payable to: A&C Company.* Mail to: **A&C FISHING ROD OFFER, Dept. 135-101, Box 1736, Hicksville, N.Y. 11802. (A29380)**

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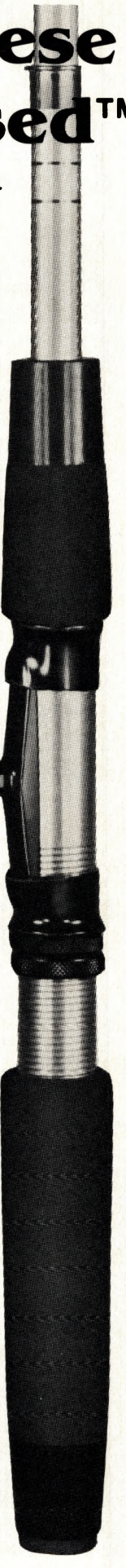


If you are able to reply before May 25, we'll give away the famous top-of-the-line SWIFT-660/F ZoomCast Spinning Reel with every rod you order *...for the astonishing price of just $2 a reel.* (And we'll even wind 250 feet of our best 6-lb-test monofilament line onto each reel!)

These nationally advertised reels perfectly match your rod in weight and balance, and give you fast "thumbs-off" (one-handed) casting over longer distances than you ever dreamed possible. You can cast even the lightest baits without backlash.

Compatible with virtually every plug or lure, the new high-speed gear ratio gives you fast "pop"-action, yet is powerful enough to reel in fish without "pumping". The new open-face design (and desirable skirted spool) eliminates friction and prevents tangles. The anti-reverse is "whisper" silent, and the Microdisc Surge-Free Drag System won't let your fish run away.

The most expensive reel sold by this huge firm, it is yours for only $2 if you act before May 25. (A25166)



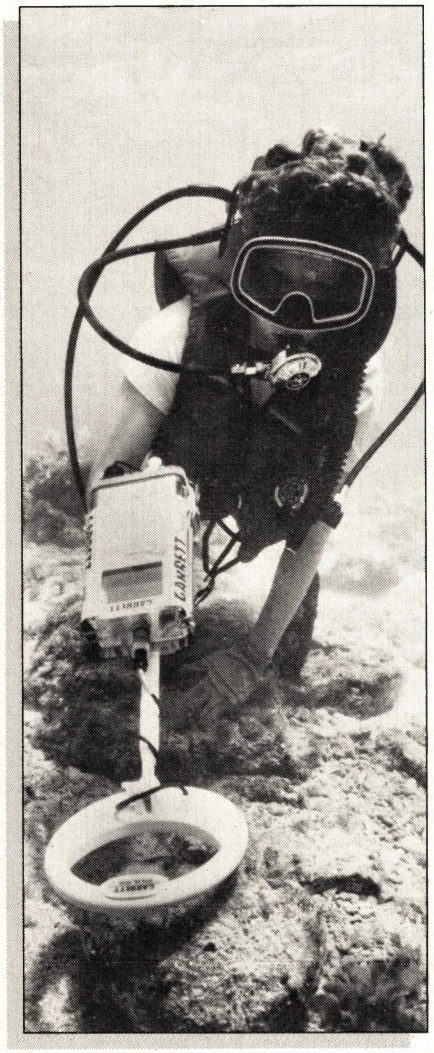
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On your next diving adventure, take Garrett along. For free information on how to get started in underwater treasure hunting, call now:

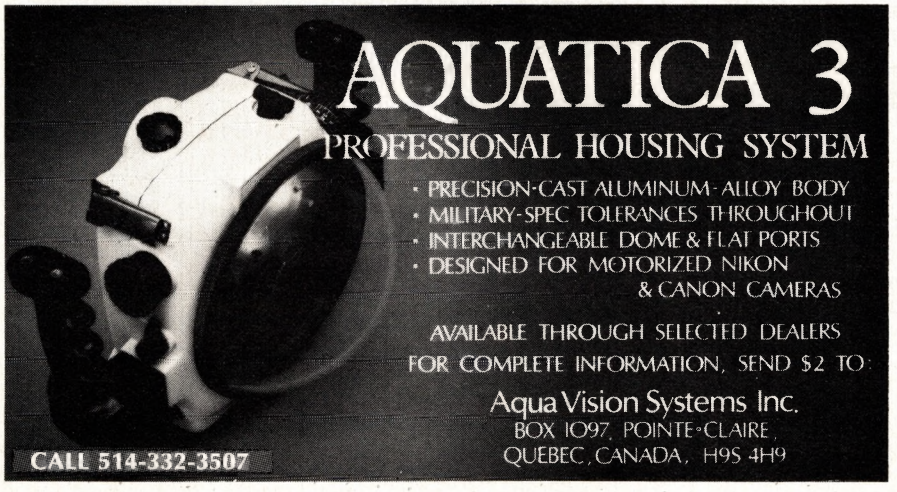
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Sea Hunter

Garrett Metal Detectors
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2814 National Drive
Garland, Texas 75041-2397 USA
214/278-6151

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NIKONOS PHOTO COURSE

Nikon and the National Association of Underwater Instructors are developing an underwater photography course, to be held May 15. The NAUI/Nikon course will address the basics of underwater photography using the Nikonos camera system. Intermediate and advanced courses are also being considered to provide a progression of training.

Retailers and instructors who would like advance information on this new program should contact Dennis Graver at NAUI HQ and/or Frank Fennell, Nikonos marketing manager, at Nikon.

DEEP PURPLE/DEEP BLUE

On a recent visit to the Caribbean island of Grand Cayman, Ian Gillian, the lead singer of Deep Purple, made a dive in Research Submersibles Limited's three man, 800 foot research submarine. The PC-8, a Perry Class submersible, is equipped with a 36 inch hemispherical viewport and four 1,000 watt lights. It is now diving daily in Grand Cayman, conducting scientific and educational missions. For more information contact RSL, P.O. Box 1014, Grand Cayman, BWI; (809) 949-3870.

AMRON INTERNATIONAL

Amron International recently opened a division in New Jersey—Amron East Coast Inc. In addition to the products offered by Amron International, Inc., the East Coast facility will offer the best in scuba equipment through the Amron Scuba Center. In addition to scuba training, the center offers special training for commercial and military diving activities.

The staff, led by the president Bart Cariello, is available to answer inquiries regarding diving equipment supplies and training. Contact them at: Amron East Coast, Inc., 426 South Country Rd., P.O. Box 72, Brookhaven Hamlet, NY 11719; (516) 286-4700.

U.S.A. SCUBA CHAMPIONSHIPS

The Midwest Diving Council will be hosting the 1986 Underwater Society of America National Scuba Championships. This competition will be held on Table Rock Lake, July 17-19. The headquarters will be at the Cove Resort in Kimberling City, Missouri.

These championships include competition in photography (July 17), scuba skills (July 18) and spearfishing (July 19). An awards banquet will be held on Saturday.

For more information contact Jana Bradley, Midwest Diving Council, 810 West Harris, Frontenac, KS 66762.

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Techni-Pro is a revolution led by world famous diver Peter Hughes. Superior dive technology creating new found freedom undersea!

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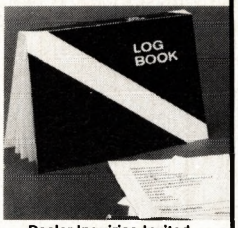
The method of bonding lenses to the mask is the only one which corrects vision exactly as your glasses do. Individually analyzed by an optometrist experienced in diving and problems of underwater vision. To order send mask, a copy of your prescription including PD (distance between pupils) and $69.00. Bifocals $30.00 extra. Airmail return $4.00 extra. We can obtain complete information from your glasses. Prescription swimming goggles also available. Send for free brochure.

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NEW! FINALLY THERE'S A QUALITY LOG BOOK

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Using DAN Correctly

TEXT AND PHOTOGRAPHY BY BONNIE J. CARDONE

Divers are using DAN: Although there were 290 emergency calls to this agency in all of 1984, during just June, July and August of 1985 there were 230. And, while the Diver's Alert Network fielded more than 2,000 medical questions in '84, during those same three summer months in '85, there were up to 30 *per day*!

It seems obvious that the publicity given DAN has worked: Divers not only know about this organization, they are seeking its help in ever increasing numbers. Because of this, it is necessary to clarify just how and when to use DAN.

EMERGENCY CALLS

In our basic certification courses most of us were taught to always carry a dime, which was to be used to call the nearest hyperbaric chamber should a diving emergency occur. You will immediately understand at least part of why this information is now outdated: A dime no longer pays for a phone call! And, it is now realized that a hyperbaric chamber is not the first place a diver should call or go to in an emergency. Why? There are several reasons. Not all chambers have the equipment needed to handle every kind of diving accident. If they do, they may not be open when needed. Also, some chambers are staffed by just one diving physician and if this person is unavailable there is no back-up. Some chambers will not treat divers because they have learned the hard way that not all health insurance plans cover diving related accidents and, they no longer wish to be stuck with unpaid bills.

One of the most important reasons for not seeking hyperbaric chamber treatment for every dive accident, however, is that many simply do not require it. Most of the time these accidents are better handled by emergency medical personnel: People who have been trained to evaluate a patient's condition and initiate the appropriate procedures immediately. It is the medical personnel who should contact DAN to discuss treatment with a DAN physician. If it is decided that chamber treatment is necessary, the DAN doc-

tor will help coordinate arrangements that will make this possible.

So, if you or one of your dive buddies is involved in a dive related accident, what should you do? DAN has provided us with the following guidelines:

A. If a life-threatening situation exists:

1. Out at sea, call the Coast Guard.

2. On land, take the diver to the nearest hospital or contact emergency rescue personnel and have a medically trained person call DAN.

B. DAN's emergency number is (919) 684-8111. This number is the switchboard of Duke University Medical Center. The person who answers the phone is not trained in diving medicine, therefore, the caller must tell the operator:

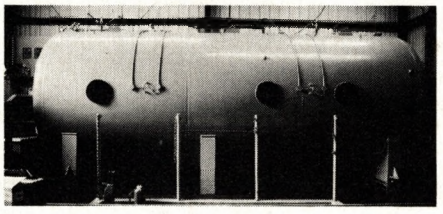
1. He/she is calling DAN.

2. There is an emergency or an urgent problem related to a dive.

3. The caller must talk to a DAN doctor.

NON-EMERGENCY CALLS

As most divers now know, the DAN staff is also available to answer non-



emergency dive related medical questions. These can be about any concern you have about diving and your health. You can call or, if you are under treatment by a non-diving physician who needs information, he or she can call. The phone number is (919) 684-2948 and it is staffed Monday through Friday from 9:00 am to 5:00 pm EST.

CHAMBER PAYMENTS

As Chris Wachholz wrote in Diving Medicine, SDM, December 1985, "No hospital or physician makes a lot of money treating divers. Worse, many divers have skipped paying their hyperbaric treatment bills or their health insurance has refused to pay." Since chamber treatment can cost anywhere from under $500 to thousands of dollars, it is easy to see why many would do what they could to avoid payment. According to DAN, chambers are getting paid only 60 percent of the time. Other health care facilities can count on payment 80 percent of the time. Non-payment of bills is a serious problem that could result in the closing of the few chambers available to divers or their refusal to treat *any* diver. DAN is at work on a solution. The agency is looking for a medical insurance plan tailor-made for divers. Already in the works is air embolism insurance. At the time of this writing, DAN was hoping to finalize this latter in time for the January DEMA Show. Look for details in future issues of SKIN DIVER.

EVOLUTIONARY TRAINING

Robotic submarines at 6,000 feet, divers at 600, job sites 100 miles off shore. The needs of the undersea industry are changing fast.

To get involved you need evolutionary training: The Professional Diving School of New York or the Underwater Vehicle Training Center in Houston.

As the training facilities for IUC, International Underwater Contractors, they stay well aware of the present and future needs of the industry. They constantly identify and define job requirements and create training programs and facilities to meet those needs.

PDSNY and UVTC student employment standings are excellent—94%* of their graduates are employed in related work.

Get the skills you need for the job you want..get the training that keeps pace... evolutionary training.

You can't afford to train with anyone else.

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222 Fordham Street,
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Telephone: (212) 885-0600
Telex: 147242

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10046 Chickasaw Ln,
Houston, TX 77041
Telephone:
(713) 690-0405
Telex: 4620684

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NEW! PROTON MAGNETOMETERS

SPLASHPROOF L4 MAG
(Limited time on these prices)

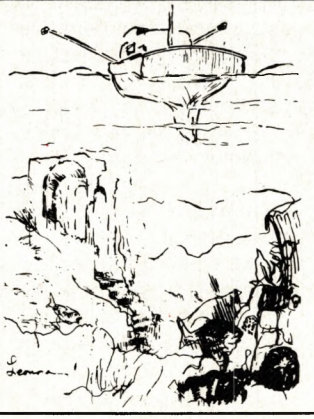
heavier gauge chassis on all mags plus outer chassis pressure tested at depth adaptable to diver-held, underwater mag
$150 OF ACCESSORIES FREE ON ALL MAGS (spkr/amplif & cable 2 o'rigger cables) AND OTHER NEW FEATURES

L4, $900 (land) 1/10 gamma
L4 SPLASHPROOF, $975 1/10 gamma
L4+t, $1200 (land) 1/50 gamma
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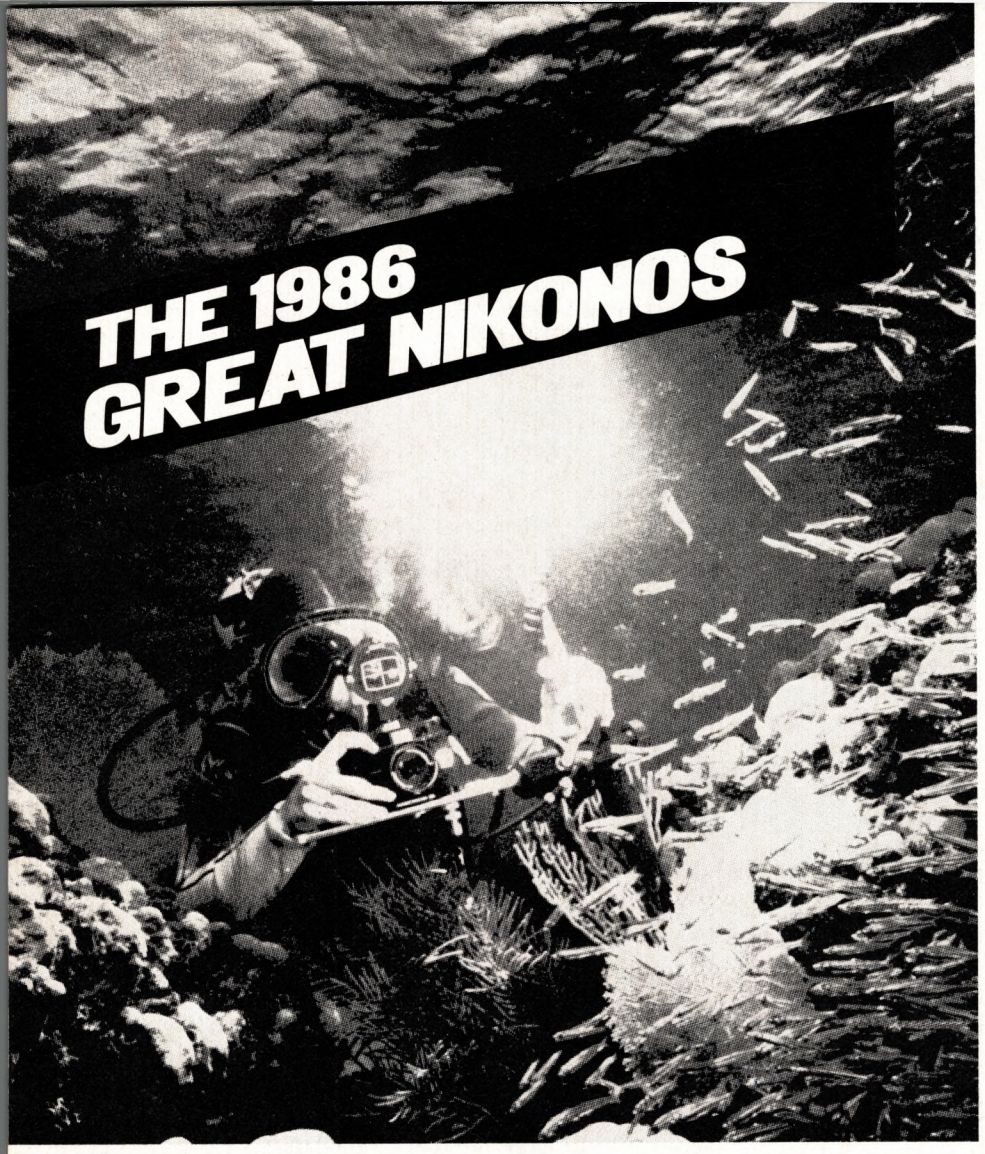


BETTER ASK "WHAT'S A MAGNETIC STORM?"

because buying a mag can be expensive. Storms & micropulses are day-to-day, minute-to-minute screams & chatterings in the earth's magnetic field which mimic & hide the call of nearby search objects or the whisper of lightweight or distant, say 1/10 gamma, objects - a plague for 1 sensor-location mags but not for LIEBHAZET.

This winds down 8 years of developing this new form of magnetic searching HYPER DIFFERENTIAL MAGNETOMETRY. Our instrument continued unpacking its math & physics during the 8 year brain-storming period when our first plucky innovating customers our R&D outlabs, and the inventor/manufacturer interacted directly. Do you older readers remember how beautifully sculptured, how star-warish those vacuum tubes were & how they were replaced by that cheap, plastic transistor? Magnetometry changes too.

Detects 1 lb. steel at 20 ft., 64 lb. at 80 ft., 2 tons at 320 ft., 125 tons at 1280 ft. (mere 1/10 gamma cond'nst). Send for free info or $2 ($3 foreign) for pic's, complete info. Send $19 ($25 foreign) for 61,000 word 54 fig. book SEARCHING WITH 1 & 2 SENSOR-LOCATION MAGS. To avoid long distance waste phone only answered when chief engineer available. Call nights & weekends too. Avoid early morning calls.



photo/Geri Murphy

SHOOTOUT

BY BILL GLEASON

Just about every photographer is familiar with the traditional underwater photo contest: You pick a few of your best slides, enter them and hope for the best. Ever think that, if everything else was equal, and given the luck of the draw, you could compete against other top notch amateur photographers and win? Especially if everyone had the same type and amount of film to expose, in the same place and at the same time? If you think you have even the slimmest chance of winning such a contest, enter the 1986 Great Nikonos Shootout. Nikon and other dive industry supporters are offering more than $50,000 in prizes to the winners of the Shootout.

The idea, brainchild of Nikonos marketing manager, Frank Fennell, is as simple as it is intriguing: Pick a few locations well known for clear, warm water (Grand Cayman, Cayman Brac and Bonaire). Invite all amateur underwater photographers, regardless of skill level or experience (no professionals), to take a week's vacation on one of these islands. While they're there, set aside one day each for wide angle (15-21mm), normal (28-35mm) and macro (macro tubes and close-up attachments) photo competion. On that day, every contestant can dive from a boat or off the shore—day or night—concentrating on shooting the perfect picture in that category. Conditions are the same for every photographer. Everyone gets a single roll of film (Ektachrome 100) the night before each contest. Starting then, it's shootout time. Everyone has thirty-six chances to win. Contestants pick the dive site and the subject, then hand in the exposed, registered roll at 5:00 pm the next day for processing. The best photo in each category wins.

While we're on the subject of winning, this contest offers prizes that haven't been seen in diving since Mel Fisher struck gold on the *Atocha*. Grand prize is a live-aboard dive vacation for two in the Philippines, hosted by See & Sea Travel, complete with air fare from the West Coast. In case you don't already have enough photo equipment, Nikon is providing $3,000 worth of underwater photo gear. If you don't come in first, don't despair. The grand prize winner is selected from the top six photos (the best wide-angle, normal and macro, three each from Cayman and Bonaire). The other top five winners get their choice of a one week diving vacation (complete with air fare from New York or Miami) in either Cayman or Bonaire. If that's not enough, there is an additional $1,800 worth of Nikon gear for each winner. If you already have too much photo gear or are tired of diving vacations and those prizes don't appeal to you, there is always the fame option: The six winners' photos will be published, in color, in SKIN DIVER.

Prizes for those who come in second and third in each category aren't shabby, either. Second place winners get a vacation for two in Bonaire or Cayman and $1,100 worth of photo equipment. Third place has to settle for just a free diving vacation. Fourth place and honorable mention receive an assortment of photo equipment and consolation prizes.

What happens if you don't win? Simply by signing up, you get a lot more than your average vacation. Stephen Frink (Cayman) and Rick Frehsee (Bonaire) will be on hand to give photo tip lectures on each category the night before each Shootout, free to all participants. You get three rolls of registered film, courtesy of Kodak. You're also invited to a Friday night social where the winners on each island will be announced. And, Nikon Professional Services (NPS) will be available on each island to loan equipment, provide expert technical advice and help out should any equipment malfunction.

The 1986 Great Nikonos Shootout will take place in Cayman the week of May 3-10 and on Bonaire May 31-June 7. You must be on the island to participate, but you should register well in advance with Nikon and make your vacation arrangements with specific resorts on the islands. On Grand Cayman, the co-sponsors are the Holiday Inn/Bob Soto's Diving Ltd. and the Royal Palms/Don Foster's Dive Grand Cayman. On Cayman Brac, Peter Hughes and Tiara Beach Hotel/Dive Tiara are the co-sponsors. Cayman Airways is the host airline here.

On Bonaire, the entire island will be buzzing the week of May 31-June 7. All three major hotels will co-host the photo competition: Flamingo Beach Hotel/Peter Hughes' Dive Bonaire; Cap'n Don's Habitat; and Bonaire Beach Hotel/Bonaire Scuba Center have all united to promote underwater photography. Antillean Airlines (ALM) is the host airline on Bonaire.

Is participating in the Shootout expensive? No! Normal vacation prices are in effect for that week and the only cost for the Shootout will be the price of developing the three rolls of film Kodak supplies each contestant. All other services are

(Continued on Page 126)

The Great Nikonos Shootout

$50,000 in prizes for the best underwater shots

Sign up Get your entry form today from your Nikon dealer—or by sending in the application below. You must be sponsored by a Nikon dealer; no purchase necessary.

Show up At two of the greatest diving islands in the Caribbean, the Cayman Islands the week of May 3-10, 1986 or at Bonaire, week of May 31-June 7, 1986.

Shoot 'em up Take your pictures. Kodak supplies the film. All you pay for is the processing. Judging will be done by the photo editors of Nikon World and Skin Diver Magazine. Winning pictures will be published in Skin Diver.

You Could Become a World Famous Photographer Overnight!



Free Seminars Everyday on underwater photography. Learn how the pros do it. Their seminars alone are worth the trip and can help you win.

CONTEST OPEN TO AMATEURS ONLY;
YOU MUST USE A NIKONOS CAMERA.
The great Nikonos Shootout will take place only on the dates and at the locations specified. You will be responsible for making your own travel and diving arrangements. Contact your travel agent for assistance. Simply be there. Good luck and good shooting.

Enter both shootouts and double your chances!

Grand Prize A week for two at one of the world's greatest dive locations–**the Philippines!** Air transportation from California paid courtesy of Philippine Airlines. Plus, accommodations on board See & Sea's luxury, live-aboard dive boat complete with captain and crew. Plus more–$3,000 worth of Nikonos photo equipment.

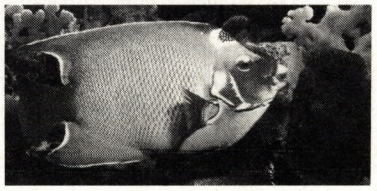
5–1st prizes One week dive vacation for two in Bonaire or the Cayman Islands, including airfare, plus $1,800 worth of Nikonos equipment.

6–2nd prizes One week dive vacation for two in Bonaire or the Cayman Islands, including airfare, plus $1,100 in Nikonos equipment.

6–3rd prizes One week dive vacation for one in Bonaire or the Cayman Islands plus $700 in Nikonos equipment.

20–4th prizes Special trophies, photo prizes and travel incentives.

Complete "shootout" details are on the entry form. Get your entry form and complete details at your Nikon dealer or send in the entry below. We'll register you and send you complete details by return mail.



Entry Form Application

Please enter me in the Great Nikonos Shootout.
Your Name _____
Address _____
City _____ State _____ Zip _____
Sponsoring Dealer _____

Send to:
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Check one or both:
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Tiera Beach Hotel/Peter Hughes Diving
Royal Palms/Don Foster's Diving
Holiday Inn/Bob Soto's Diving

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Technifacts

BY E.R. CROSS



In late November, 1985, I made a 5,000 mile excursion from Hawaii to a small part of Southern California and back to Hawaii. On my working agenda were visits with SKIN DIVER Magazine, College of Oceaneering, some divers in the Los Angeles area, Luxfer USA Limited and then on to San Diego for four fantastic days at IQ-85.

I have been SKIN DIVER's Technifacts editor for 20 years. Naturally, when I visit Los Angeles the magazine is a must stop. During my visit there I enjoyed long talks with Editor/Publisher Bill Gleason, Managing Editor Connie Johnson, Executive Editor Bonnie Cardone, Art Director Art Smith and others of the staff. Besides reinforcing long standing friendships with these people, we worked out my schedule of articles for the next several months—I am looking forward to an exciting year!

At the College of Oceaneering in Wilmington, I had a day-long visit with president and executive director Jim Joiner; managing director of operations Tom Mix; special programs coordinator Tommy Thompson; and assistant corporation secretary Judean McBrien. My visit provided an insight into the purpose and scope of training provided divers who want to enter the challenging fields of commercial diving. These activities will provide material for a feature article and at least two Technifacts, covering aspects of training that will be of interest to the thousands of sport divers who are readers of SDM.

The next in-depth visit was to the Luxfer USA Limited plant at Riverside, where I spent the day seeing how dive tanks are made, tested and certified safe. With me, Chuck Locke of U.S. Divers and Luxfer's chief engineer in tow, vice president Jim Ament toured the plant and explained each step, test, evaluation and certification needed to manufacture aluminum tanks from the raw "logs" of aluminum shipped to Luxfer from the smelter at Kitimat, British Columbia, Canada. With some interesting photos this should make an informative Technifacts in one of the months ahead.

In San Diego at IQ-85, I was not really prepared for the extravaganza of informative workshops, manufacturer and dealer exhibits and the quality and number of lecturers. Held this year at the Town and Country Hotel convention center in San Diego, this NAUI sponsored International Conference on Underwater Education was, by itself, worth the time and expense of my trip from Hawaii. The added attraction was that this IQ also celebrated the 25th anniversary of NAUI.

Before outlining briefly some of the feature attractions of IQ-85, it seems appropriate to mention the hard workers who made it happen. Drs. Ron and Susan Bangasser, conference directors; Jim Corry, exhibition coordinator; Ronni Damico, program coordinator; Bill Gray, op-

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Specifically Designed For Divers By Divers.

DIVE-MED is acclaimed by top divers throughout the world who always include **DIVE-MED** when they pack their gear bags, and who would not leave on a trip, dive, or expedition without **DIVE-MED** or **PRO-DIVE-MED** along for safety.

DIVE-MED or PRO-DIVE-MED are ideal for use by the weekend scuba diver or snorkler and the professional diver who must rely on the very best life saving equipment.

Our container is molded of the well-known, high impact Polymer Cycolac T® (ABS) from *Borg Warner Chemical Co.* We have constructed the container, with its water-tight seal gasket of neoprene foam, to meet or exceed the standards of:

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★ National Standards Institute Standard 2308.1-1978-(4)(a)(b)
★ Federal Aviation Administration Regulation FAR-853-B3

Well-known as THE DIVERS FIRST AID KIT, **DIVE-MED** and its contents have been designed in cooperation with *Divers Alert Network (DAN)* at the Duke University Medical Center.



Available in three sizes; standard, deluxe and **PRO-DIVE-MED**. Ask your local dive shop, or write to:

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Why Are We Giving Away Famous Nationally Advertised™ MALIN M-15™ SURVIVAL KNIVES for only $4?

Hard to believe, *but true!*

As part of a nationwide advertising campaign, a New York firm will give away one million (1,000,000) of its most expensive hunting knives—the best-selling MALIN-15™ SURVIVAL KNIFE—for the astonishing publicity price of only $4 each to the first one million persons who write to the company address (below) before Midnight, May 31, 1986.

This *original* publicity ad must accompany your request. Copies or photostats are *not* acceptable.

These knives are not copies. These are *genuine* MALIN M-15™ SURVIVAL KNIVES—the same famous survival knives nationally advertised in leading media throughout America. They are the most popular (and most expensive) hunting/fishing/camping knives of their kind ever sold by this multi-million-dollar firm.

A foot long and r-r-r-r-r-r-r-razor sharp!

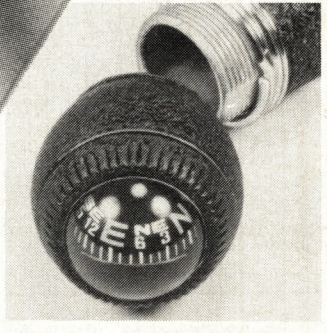
If you had to describe the MALIN M-15 in just one word, that word would have to be...*big!* Each MALIN M-15 is a whopping 12 inches long—*a foot in length!*—yet so perfectly balanced it cuts and thrusts like an extension of your own hand. Heft this beauty just once; you'll never want to put it down!

Each MALIN M-15 blade is crafted *entirely of 420 molecular stainless!* Thick as a silver dollar at the spine, it's tough enough to split wood or shatter bone. Yet the edge is so wickedly sharp it slices thin as a whisper!

Survival Kit hidden in the hollow handle

But that's not all! In the pommel of each MALIN M-15 is a precision ZF-360 Liquid Damped Compass. And when you unscrew the compass—there is an astonishing Survival Kit complete with packet of waterproof wrapped matches, half-a-dozen fishing hooks, sinkers, nylon test fishing line, sewing needle kit—even an 18-inch cable saw actually capable of cutting down a a small tree. No wonder this is the best-selling survival knife of its kind ever sold by this multi-million dollar New York firm.

Compass Unscrews To Reveal Survival Kit



These Famous Nationally Advertised MALIN M-15 SURVIVAL KNIVES will not be sold at this price by the company in any store. There is a limit of two (2) per address at this price, but if your request is made early enough (before May 25) you may order up to five. Each knife is covered by the company's unconditional one-year money-back guarantee.

To get your MALIN M-15 SURVIVAL KNIFE, mail this *original* publicity ad (no copies or photostats) together with your name and address and $4 for each knife. Add only $2 shipping and handling per knife. (New York residents add sales tax.) Allow up to 6-8 weeks for shipment. *Make check payable to CVP Co.* Mail to: **CVP MALIN M-15, Dept. 135-100, Box 1201, Westbury, New York 11595. (V22830)**

FREE Sheath & Sharpening Stone if you respond before May 25



Heavy duty sheath for your belt is 1-foot long with lanyard, 6-rivet construction, haft retainer, and built-in snap-pouch for sharpening stone (stone included).

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TECHNIFACTS

erations manager; and Thomas Harbin and Margie LaRue, audio/visual coordinators, were the well organized keys to the success of this giant and well produced and directed dive show.

Certainly one of the most important products of IQ-85 was the 375 page Conference Proceedings. A copy of these is the next best thing to having been there and can be obtained from NAUI, P.O. Box 14650, Montclair, CA 91763. It will prove invaluable to sport divers to increase their diving knowledge and improve their diving skills, regardless of their level of training and experience.

A tip for those who want to get the most out of a diving conference or symposium: By obtaining a copy of the proceedings it is possible to schedule attendance at all presentations, such as slide shows, films or lectures that have not been reproduced in the printed publication. A copy of the proceedings is a must in any event since it is not possible to attend the many overlapping sessions.

Some of the presentations in the unpublished category I attended included Creatures of the Sea and Sea Monsters and Sharks by Dr. Eugenie Clark. Both of these contained a lot of background information that would not have been part of a printed publication. Also, it was enjoyable having the opportunity to talk with and question Dr. Clark after her appearances. Other similarly unpublished programs were those of Dr. Sylvia Earle, dealing with deep ocean exploration; Diving Safety Research, presented by Dr. Glen Egstrom; Commercial Diving, by Larry Cushman, president of the Ocean Corporation in Houston, Texas, and one of the NAUI instructors who organized the first International Conference of Underwater Educators (ICUE), now called IQ, in 1969; and Jim Stewart's Collecting for Major Aquaria. Jim is diving officer at the Scripps Institute of Oceanography.

Another aspect of attending lectures, whether published or not, is to attend presentations that are of special interest. These offer opportunities to ask questions and obtain references for additional study. One such program in which I had a special interest was Dr. Art Bachrach's Models of Stress Control in Diving.

In a category by themselves were the underwater films, presented by Jack McKenney, one of the best and most entertaining underwater photographers in the business. And, again, it was good to reinforce an old friendship.

There were the classes for those who wished to further their skills in specialty fields of diving. For those interested in underwater photography, Jim and Cathy Church, popular contributors to SKIN DIVER Magazine for at least the past 15

years, presented an 11 hour course that would improve anyone's underwater photography skills. For me a very positive benefit was the pleasure of meeting this exuberant and charming couple for the first time.

Still another interesting and informative part of IQ-85 were the exhibitors' booths. These offered an opportunity to inspect new equipment and discuss it with manufacturer's representatives.

There were other, non-equipment, booths, too. One that was always crowded was that of the San Diego Council of Divers. With dinosaurian Bottom Scratcher members Wally Potts and Jack Pradonovitch in almost constant attendance (with their double four-band spearguns, first-ever diving masks and snorkels and with photos of their diving activities from about 1930) it is little wonder that this booth was always filled.

At the SKIN DIVER Magazine booth I met and talked with magazine representatives. Close by was a five booth, colorful, presentation of the 100 foot visibility in the Cayman Islands that had me convinced (almost) that I should leave Hawaii's clear waters. The International Association of Dive Rescue Specialists booth was very informative. While there I talked at length with members of Los Angeles County Sheriff Herman Block's Emergency Services Detail—a fantastic, well trained group of divers.

Another group of well trained divers I met and talked with were members of the Handicapped Scuba Association. Their video presentation of the activities of members gave me a new insight into how much this group of able-to-cope individuals enjoys diving.

OLD FILM FOLLOWUP

In the December list of old films I missed at least one oldie-but-goodie—*The Wake of the Red Witch*, starring John Wayne. It was filmed, probably, in the 1950s. Can a Technifacts reader provide more data on this film? The *Wake* was a story about the chase by a sailboat of the second vessel with a treasure. There is a lot of diving and some good underwater footage in this film.

INFORMATION NEEDED

Shelpin Patel, Sri Aurobindo International, Centre of Education, Pondicherry 605002, India, wrote asking if anyone can provide a copy of the operation and maintenance manual for the Kidde high pressure air compressor, 3,000 psi, 4 cfm, 3,750 rpm, stock number W.K.No. 890223, Serial No. 540127H. The address of the manufacturer at the time this unit was made was Walter Kidde and Co., Inc., 675 Main Street, Belleville, NJ. Can any SDM reader help? Regulations and customs duty make it almost mandatory that this organization's aging and ailing Kidde unit be repaired. For this they need the manual.

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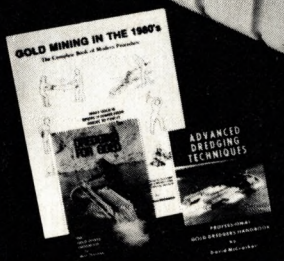
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Tekna Xena Lite

A Multi-use Diver's Lantern

TEXT AND PHOTOGRAPHY BY GERI MURPHY

Tekna, developer of a dozen different underwater lights, has introduced a giant daddy to top the line. This mega-lantern features a 5.5 inch reflector, ultra bright xenon gas bulb and four D-cell batteries for a long burn.

The Xena Lite reflects the needs of those who like a big light for night diving as well as offering a few new high-tech twists we've not seen before.

The body of the light is a beefy cylindrical case of rugged ABS thermoplastic. A threaded retainer ring holds the 5.5 inch reflector in place. The front lens is equally tough clear Lexan®, which can take a beating. The case is tested and guaranteed to a depth of 300 feet.

The reflector is a newly designed parabolic dish with a high intensity mirror finish that is extremely efficient. Seated in the center is Tekna's pride—a specially designed custom xenon gas bulb that outshines any bulb of its size. The bulb and reflector produce a measured 50,000 candle power. This bulb burns whiter, brighter and lasts 50 percent longer than conventional vacuum lamps.

Behind the reflector is a compartment that holds four large D-cell batteries. These large capacity cells are both inexpensive and long running. The Xena Lite will operate for four to six hours with the xenon bulb or 16 to 20 hours with a normal bulb.



The Xena Lite is powered by four D-ceils. Available with either a pistol or lantern grip, it has a removable weight, high-tech reflector and backup bulb.

The Xena Lite offers a few special features that make it a bit unusual. It is available with one of two different handles—a pistol or a lantern grip. The handles slide into a shoe mount on top of the case and lock into place. The pistol grip is ideal for diving, while the lantern grip is great for use on a boat, in a car or at home. Additional handles of either design are available for $9.95 each.





The light's on/off switch is built into the individual handles. It consists of a magnet mounted on a ballpoint pen type, spring-locking plunger. Push once to turn on and push again to turn off. The magnetic switch eliminates a through-hull fitting and greatly reduces the risk of leaks.

Inside the case is a circular ring-type lead weight that is easily removable. The weight establishes a two ounce negative buoyancy when the light is used underwater. It can be removed when the light is being used for surface or land purposes. Boaters will love it, since the light floats when the weight is removed.

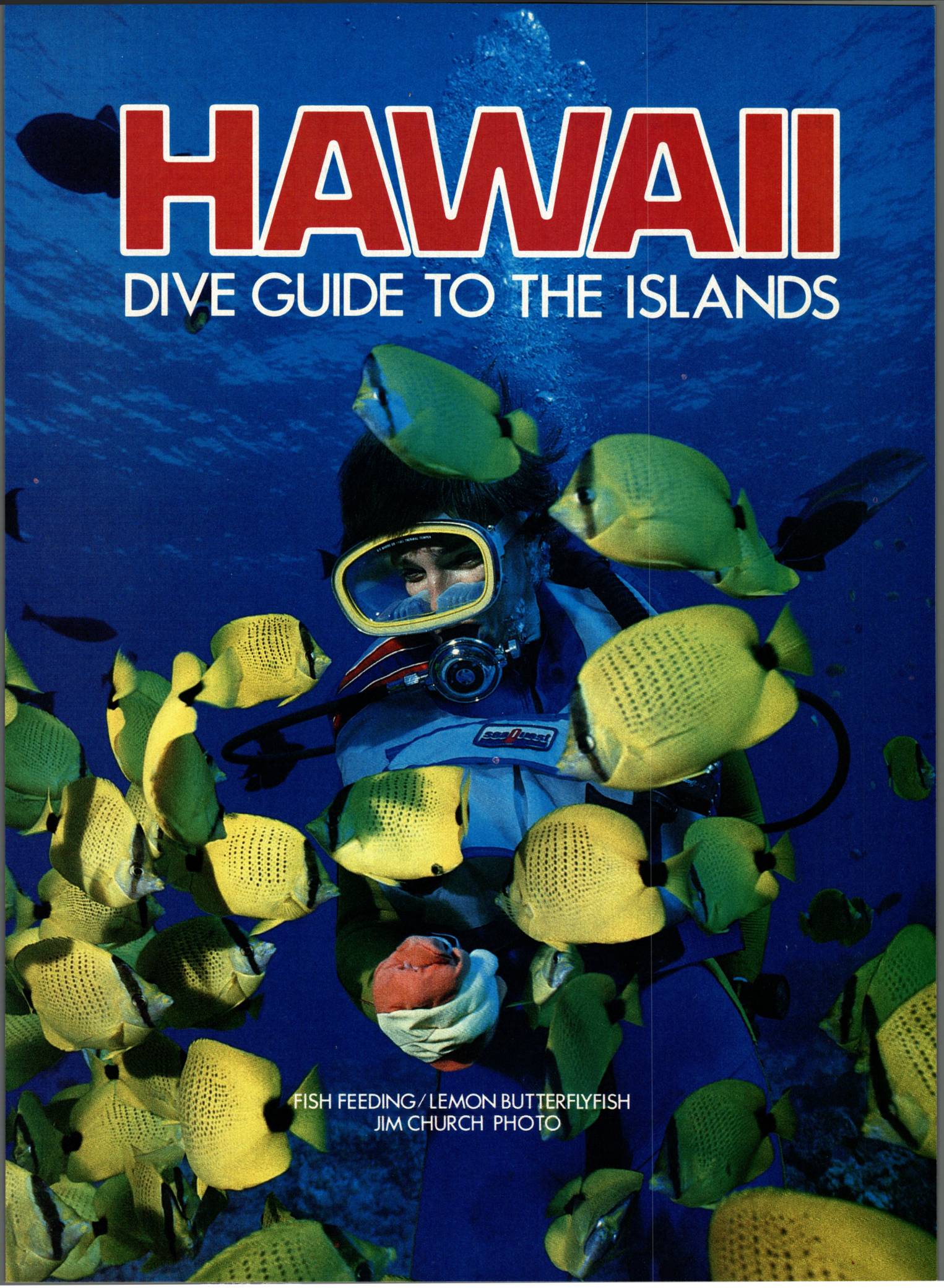
Tekna was also thoughtful enough to insert a backup bulb inside the case. It is positioned between two of the D-cells. It is a standard PR-13 bulb, not as bright as the xenon bulb, but it will produce an extended run time of 16 to 20 hours with a fresh set of batteries. If you prefer the ultra bright xenon (T-8002), you can purchase a replacement for $6.95.

We tested the Xena Lite and found it worked great for several dives without a change of batteries. I especially enjoyed using D-cells as it eliminated the annoying task of recharging batteries. Just tuck the light in your gear bag and forget about it. The switchable grips were appreciated when the light was used topside. The change was made easily in a matter of seconds.

The T-8000 Xena Lite (with lantern grip) sells for $49.95. The T-8001 Xena Lite (with pistol grip) is the same price. For more information, contact your local Tekna dive store dealer or Tekna, 1075 Old County Road, Belmont, CA 94002; (415) 592-4070.

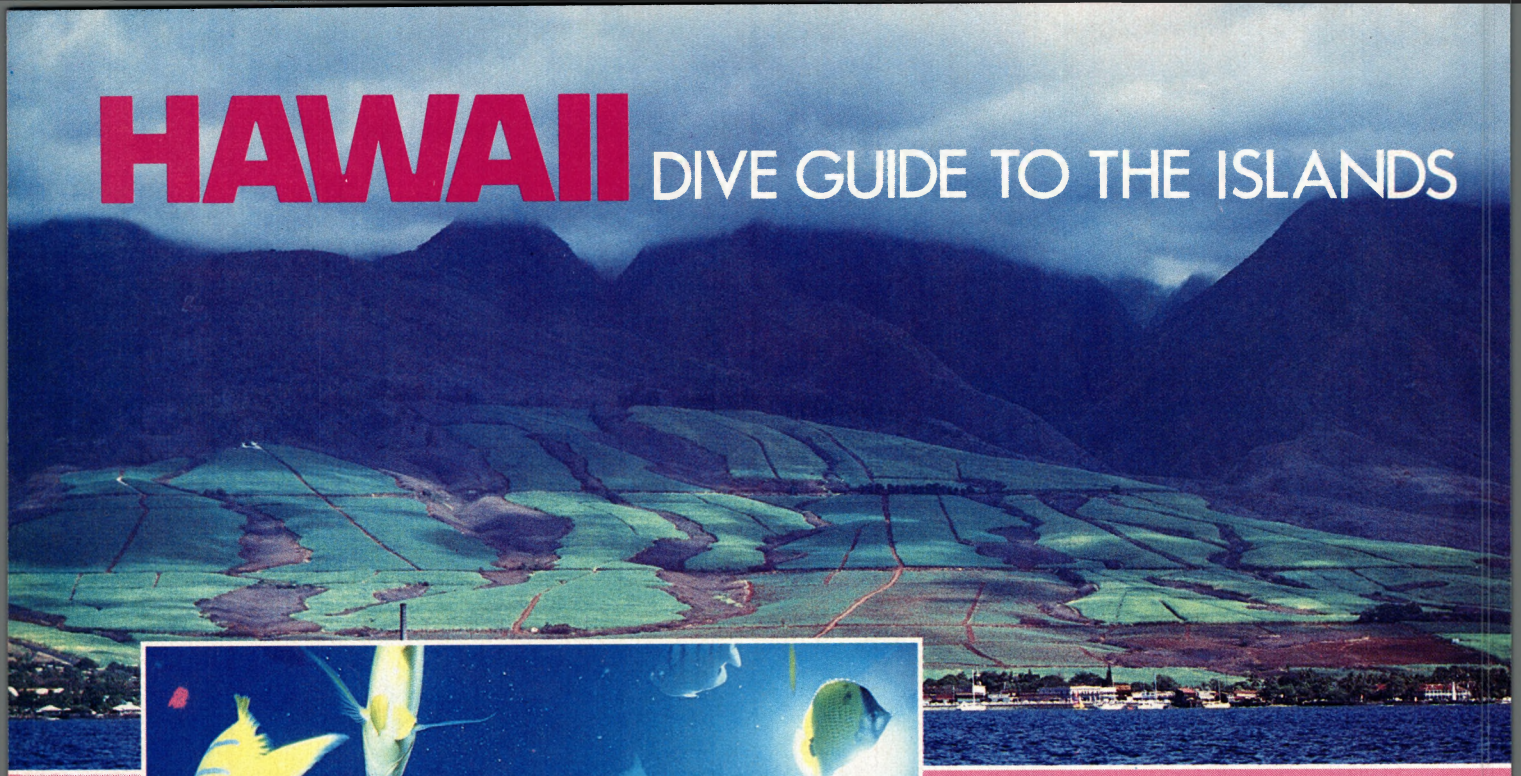
HAWAII

DIVE GUIDE TO THE ISLANDS



FISH FEEDING / LEMON BUTTERFLYFISH
JIM CHURCH PHOTO

HAWAII DIVE GUIDE TO THE ISLANDS





Maui, Lanai, Oahu, The Kona Coast And Kauai





Top: Below mountains shrouded in clouds, bright green fields of sugar cane seem to flow down to meet the sea on the island of Maui. Above: Cathy Church examines colorful encrusting sponges at Nob Hill off Lanai. Left: With fish waiting their turn for a snack, divers feed Hazel the eel off Molokini. Below: A colorful flatworm in Kauai waters.

TEXT AND PHOTOGRAPHY BY JIM AND CATHY CHURCH

Imagine yourself shopping for rare gifts, enjoying new sights and tastes, relaxing on sandy beaches, snorkeling or scuba diving, or even soaring through rugged volcanic valleys in a helicopter. These are only a few of the many delights that await you in Hawaii.

The Hawaiian Islands offer a foreign culture with all of its interesting customs and melodic words—all the joys of visiting a new land without losing the advantages of being in the U.S. English is the main language, electricity is 110 volt, U.S. dollars are the accepted currency and traveler's checks and credit cards are generally accepted. U.S. citizens need not fuss with passports, customs, immunizations or other red tape. The politics are stable, the people are friendly and upbeat and their happy aloha spirit makes you feel welcome.

On any Hawaiian island, plan on balmy weather. In lowland and beach areas, temperatures will be about 65 to 80°F in the winter and 73 to 88°F in the summer. Upland areas can vary from 50 to 70°F and mountain tops may have lows of 20°F. The trade winds can be blustery in winter and short rains are more frequent. In spring and summer, rainfall is less frequent and often occurs only at night.

Terrain, fish, action and visibility are the key words that describe Hawaiian diving. You can swim through colorful lava tunnels that lead to breathtaking undersea cathedrals; bright, tropical fish will feed from your hand; large eels peer at you from their lairs. You may be suddenly surrounded by dolphins or see huge manta rays glide by in the distance. Visibility can vary with weather and dive sites, but may be 100 feet or more.

Look for the hundreds of different kinds of beautiful tropical fish that are a feature of Hawaiian diving. One-third of the reef fish species are found only in Hawaii. Look for the hard corals, black coral, octopus, eels, hidden nudibranchs and shells. Most invertebrates will be different from those found in the Caribbean.

Between November and May, when the humpback whales migrate to Hawaii to breed, listen for them underwater. You can hear their melodic songs for up to a mile away, but you'd think they were just a few feet behind you. At some locations your divemaster may be able to show you a shark upon request. But don't worry—it is probably one of his/her pets.

If you are accustomed to 85°F tropical water, bring a shorty wetsuit for summer and a full 1/8 or 3/16 inch suit for winter. Hawaiian water temperatures average about 70°F in the winter and 75°F in the summer. Some dive operators provide wetsuits as part of their dive program—inquire ahead of time.

The Hawaiian Islands are about 2,400 miles southwest of California. Your flight takes about five hours from West Coast cities, nine hours from Chicago and 11 hours from New York. Several U.S. airlines connect the U.S. mainland to Hawaii. Western Airlines, for example, has flights to Honolulu from San Diego, Los Angeles, San Francisco and Anchorage, Alaska; and directly to Maui from Salt Lake City and Los Angeles.

Interisland travel is easy. The three airlines—Aloha, Hawaiian and Mid-Pacific Air—connect the major island airports with frequent daily flights and connect the smaller airports at least once a day. Royal Hawaiian Air Service connects 11 small airports throughout the Hawaiian Islands, including Honolulu to Kaanapali, Maui. Most flights are less than one-half hour. We flew with Aloha Airlines and were pleased with the friendly treatment we received. Aloha never charged us for overweight baggage and our luggage was always delivered to us promptly after each flight.

Several rental car companies can provide cars. We used Avis during our visit and received excellent service. Avis provides great drive guides with maps and details for each island, and a coupon



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HAWAII

book for substantial discounts for meals, admissions to shows and other services.

REAL HAWAII, a travel agency and condominium management company, has special air/car/dive/condo packages. You can usually arrange everything with one phone call to: (800) 367-5108. Owner John Laures knows the islands, the dive operators and the condominiums Real Hawaii manages. He recommends his packages for visitors who wish to stay for a week or more and desire accommodations larger than hotel rooms.

DESTINATION HAWAII

Destination Hawaii is an association of dive operators and related businesses. They work to maintain the quality of services and safe practices in the State of Hawaii. Membership indicates that the operator is interested in providing diving services for travelers. Destination Hawaii also works to promote Hawaii as a major diving and snorkeling destination.

MAUI

Maui has so many different personalities—from sophisticated resorts to remote mountain hiking trails—that it is difficult to describe them briefly. You can soar past massive cinder cones in a helicopter, coast 38 miles down the winding slope of Haleakala on a bicycle, golf on any of ten courses and charter a boat to go deep-sea fishing.

Maui is a large island with two major dive destinations: the Kaanapali/Lahaina area to the north, and the Kihei/Wailea area to the south.

Maui's dive shops and charter operators offer first class, professional service. The divemasters, instructors and boats are fully certified and the operators know the local waters and marine life.

BLUE CHIP CHARTERS, at the luxurious Hyatt Regency Maui, at Kaanapali, is a complete dive service owned and operated by Valorie Spence. Valorie and her staff love working with novice divers (over the age of 12). For experienced divers, Valorie's 38 foot Delta can take up to 18 divers to nearby and interisland sites. Good food is served aboard and you can enjoy an open bar after the dive. Her 22 foot Boston Whaler, *Blue Chips*, accommodates smaller groups of six or less.

CAPT. NEMO'S OCEAN EMPORIUM, a full service, well stocked dive shop at 700 Front Street, Lahaina, is owned by Capt. Michael Tansey and managed by Lynne Palmer. Mike is a PADI ITC director and his staff can instruct in all levels of scuba.

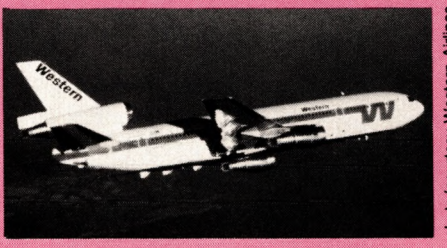
Nemo's racing catamaran, the 58 foot *Sea Smoke*, sails from Kaanapali for a luxury excursion to Lanai for snorkeling, scuba diving, photography and sailing. For special dive trips for small groups of certified divers, Nemo's uses a 26 foot cabin cruiser with canopy cover.

Capt. Nemo's is a one-stop shop. Not only do they offer dive/hotel/car packages, family and individual dive and snorkel trips, but they can also arrange many other Maui activities for you.

CENTRAL PACIFIC DIVERS, on Front Street, is owned by Jane and Pete Cambouris and Jim Patterson. It's always fun to see the same friendly crew year after year. Senior captain Carol Takashima has been with CPD for nine years, and store manager Jon Good for eight years. Overall, the average tenure is five and one-half years and CPD is Maui's oldest dive operation.

Since CPD specializes in boat diving for experienced divers, their boat trips

Western offers many flights to Hawaii.



photo/courtesy Western Airlines

MAUI 1986

1986 is the year to dive Maui—
Central Pacific Divers offers daily interisland diving trips to the best spots in Hawaii.

Dive Lanai to more than 20 great sites where you will see lava tubes, arches, caverns and world famous Cathedrals.

Dive Molokini, a marine preserve on the inside of a partially submerged volcanic crater. Enjoy walls, reefs, sleeping white tip sharks, clouds of lemon butterfly fish and tame moray eels.

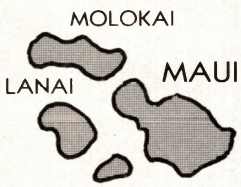
Dive Molokai, Kahoolawe and the backside of Maui, providing a variety of diving that is hard to beat. All accessible from Lahaina Harbor and an easy boat ride.

Central Pacific Divers has year-round diving and unsurpassed service aboard *Odysseus* and *Zephyrus*, two 43′ Coast Guard certified luxury dive boats.

Maui is a unique vacation paradise that not only has fantastic diving, but also hundreds of nondiving activities for your time-off.

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reach out to Kahoolawe, Lanai, Molokai, Molokini and the Maui sites. CPD's 43 foot *Odysseus* and 45 foot *Zephyrus* carry up to 14 divers each.

CPD is building the Plantation Inn, a small two floor bed and breakfast inn with authentic turn-of-the-century Hawaiian elegance. The combined operation of the inn and diving will keep total prices affordable. Only a few blocks from the CPD shop, the inn will feature many benefits for divers.

DIVE MAUI, a full service dive shop just off Front Street, is owned by Leslie Sternberg. Leslie is excited about her new 24 foot *Explorer*. The dry, fast, smooth riding Privateer with a shaded protected area forward, will be limited to only six divers. Sternberg's 23 foot Mako is launched from Maalaea Harbor to shorten the trip to Molokini.

HAWAIIAN REEF DIVERS, a full service dive shop on Lahainaluna Road, in Lahaina, is owned by Jim and Vivien Bellamy and managed by Jim Lowry. Their 36 foot Hydronaut and 26 foot Chris Craft take divers to two local reefs and interisland locations with a picnic lunch of fruits, chips, juices and sandwiches. They can handle experienced divers, but also cater to novice, new or rusty divers who wish to enjoy a shallow reef dive. The popular five hour picnic cruise is for mixed groups, such as families with both snorkelers and scuba divers. Hawaiian Reef Divers has packages with several condos and a three bedroom house.

HAWAIIAN WATERCOLORS, a specialized charter service, is owned by Ed Robinson. Ed, his wife Sue, and Capt. Roger Pannier use two 21 foot Boston Whalers to take up to five divers on personalized dives from Kihei to Molokini, South Maui. He will show you his favorite undersea creatures—you can't collect them, so everyone gets to see them. Ed is generally credited with taming several of the eels at Molokini. As an excellent U/W still and video photographer, he can provide photo services and coaching.

LAHAINA DIVERS is a full service shop on Front Street. Owned by Blain Roberts and managed by Marvin Wolpa, they offer daily half-day boat trips. Their new 43 foot *Reliant* carries 3 to 16 divers at speeds of up to 20 knots. For personalized diving for smaller groups, Lahaina Divers' 31 foot *Nomad* takes 2 to 12 divers and their 24 foot *Argonaut* takes two to six.

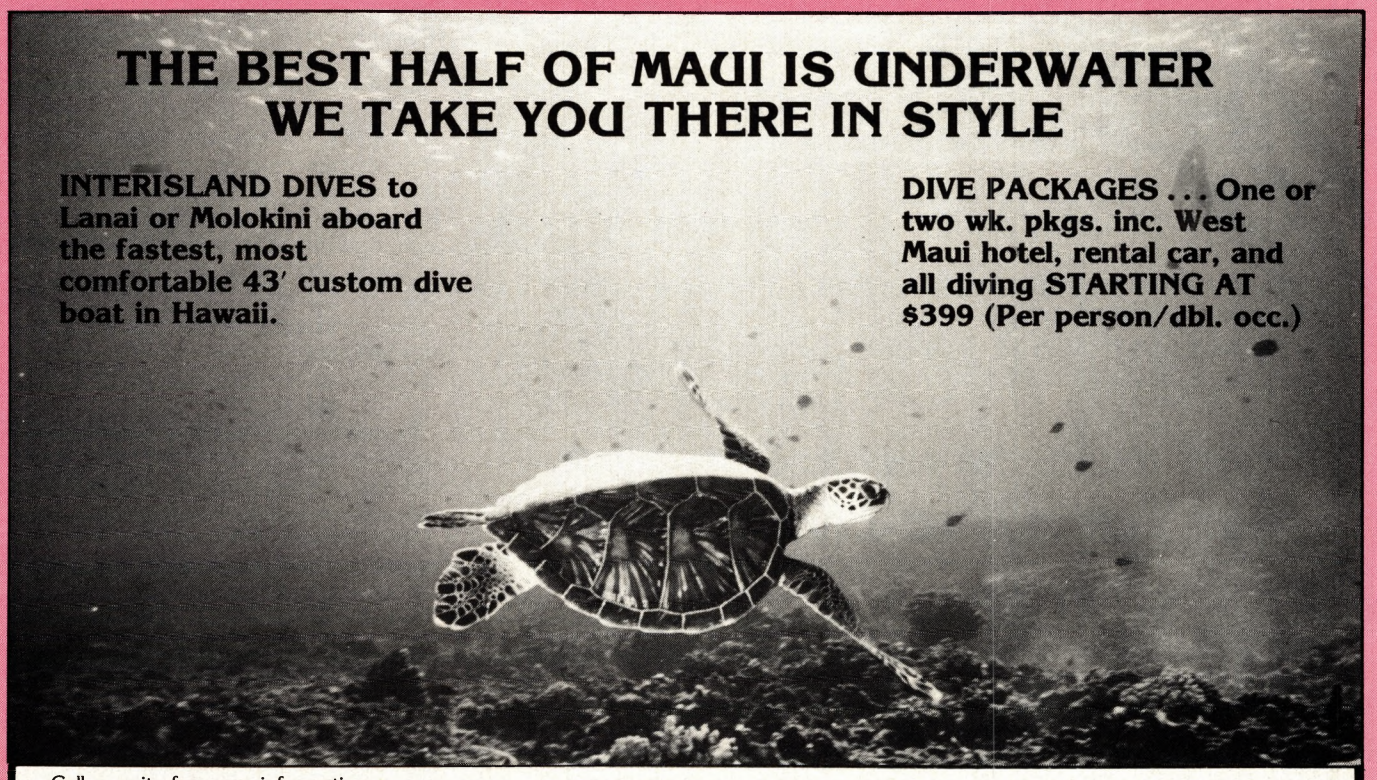
A PADI Five Star Training Facility, Lahaina Divers offers free mini-scuba lessons at the Maui Marriott and Maui Islander pools. They offer introductory and refresher dives, four day open water certification courses every Tuesday through Friday and all the PADI specialty courses. Lahaina Divers also has an U/W photo service. They photograph guests underwater and give them the unprocessed rolls of film.

MAUI DIVE SHOP, owned by Robert Chambers, has locations at Azeka Plaza, Rainbow Plaza and Kihei Town Center, all in Kihei. They specialize in retail sales and dive instruction. Their boat diving is done with Ocean Activities Center.

OCEAN ACTIVITIES CENTER is centrally located at Maalaea Harbor, midway between Kaanapali and Wailea. OAC has a dive package with Maui Sunset Condominium, which can be arranged through Real Hawaii. They have the closest luxury dive boat to the Kihei/Wailea dive sites and you can park next to the boat at the dock. Their trip to Molokini is a short ride on a big boat—the 37 foot *No Ka Oi IV*, a twin-diesel Tolleycraft that carries up to 10 divers. As part of their excellent service, farmer john wetsuits and one-eighth inch jackets are provided for divers.

Ocean Activities Center uses the *Maka Kai*, a 57 foot power catamaran, to take up to 60 people to Lanai for snorkeling, a land tour, lunch and an authentic hula show at the Hotel Lanai. And, for Molokini whale watching and snorkeling trips, they use the *Wailea Kai*, a 65 foot catamaran.

SCUBA SCHOOLS OF MAUI is three blocks inland from Front Street, Lahaina. New owners Don Arnold and Rod Quam have completely redecorated the shop.

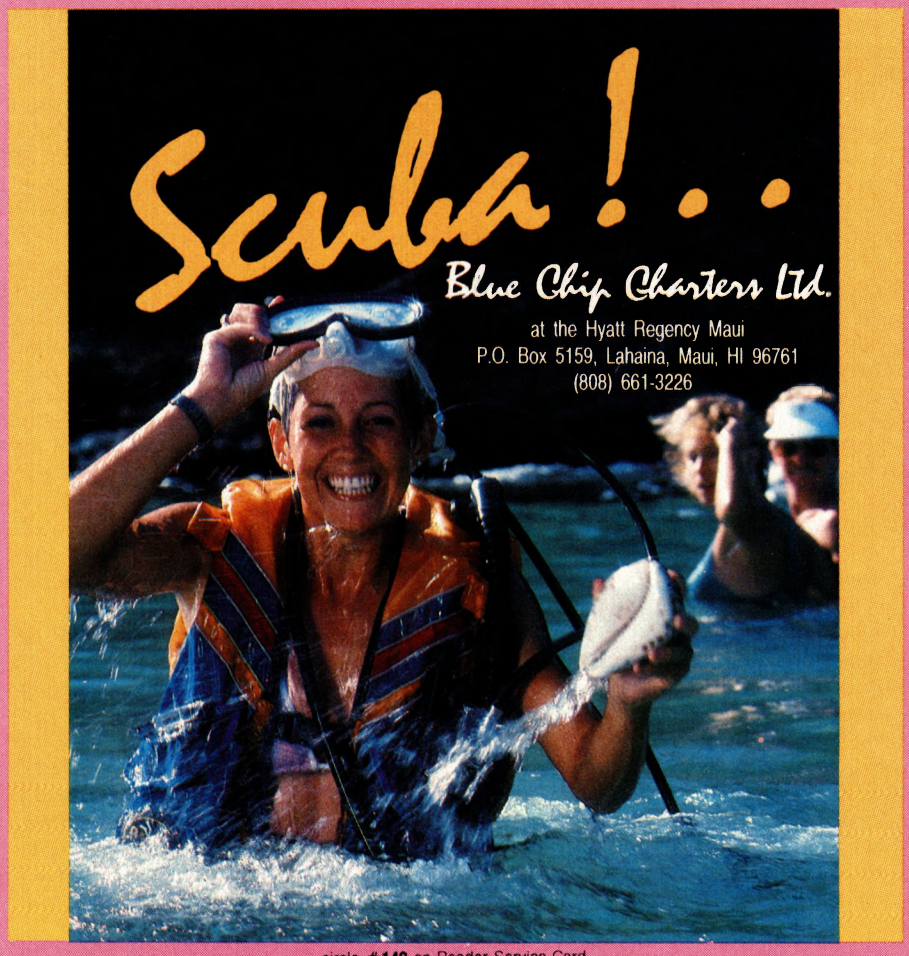


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Lahaina Divers, Inc.
710 Front Street, Lahaina, HI 96761
800-367-8047 ext. 102 or 808-667-7497

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Address: _____
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HAWAII

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Scuba Schools of Maui has a small but comfortable room for instruction up to assistant instructor. Classes are held daily.

THE DIVE SHOP OF KIHEI is managed by Marilyn and John Phipps and owned by the Phipps and Linda Kowalski. Using a 25 foot Boston Whaler with a canopy, they take up to six divers on four hour dive trips. They offer a specialty lobster dive (in season, by request only). Their 37 foot trimaran takes up to six snorkelers or divers on a leisurely sail to Molokini. They also operate Maui Activities Unlimited, which can make reservations for various Maui activities.

TRILOGY EXCURSIONS, owned and operated by the Coon family, offers luxury snorkeling excursions to Lanai aboard three multi-hulled sailing vessels, including the 50 foot trimaran ketch, *Trilogy*. Their trips are loaded with extra touches. They provide prescription masks for snorkelers, family-baked cinnamon rolls for breakfast and a sit-down BBQ lunch, with china and silverware, on the beach at Lanai.

TROPICAL DIVE SAIL, INC., is a dive charter operation in Lahaina. Owners Wayne Petersen and Steve Sadler use a 24 foot power catamaran for daily trips to Molokini for up to six divers. The eight foot beam of this unique craft provides an amazing amount of deck space and the multi-hull provides excellent stability for their 20 knot craft. They greet you with coffee and pastry in their van when they pick you up.

MAUI DIVE SITES

In addition to the dive sites just off Maui's shores, many of the dive operators also reach out to the neighboring islands of Lanai and Molokini. Some even arrange special charter trips to Kahoolawe and Molokai. Because some trips can be long, bring a wetsuit and a light jacket to keep you warm. To avoid afternoon trade winds, Maui dive trips often leave at 7:00 am. Although most hotel restaurants won't be open for breakfast, there is an expresso coffee and pastry shop near the harbor and morning coffee and pastries are usually served aboard the boats.

Ahihi Bay is a marine preserve, near La Perouse Bay, with lava caves, pinnacles and large coral heads in depths from 30 to 60 feet. You'll see plenty of exotic tropicals. Schools of sergeant majors and goatfish are common.

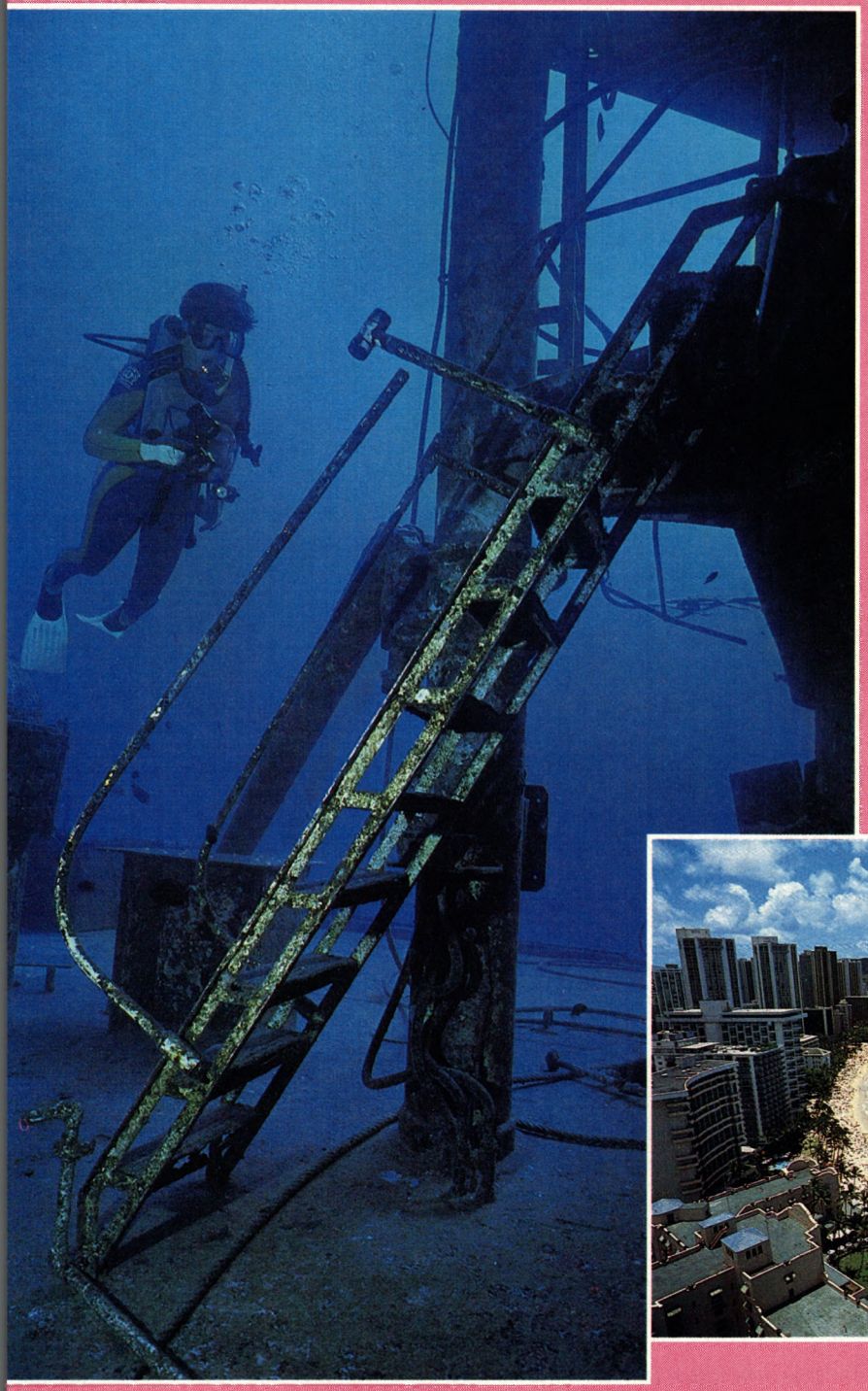
Black Rock is a lava cliff from 0 to 30





Above and below: Divers explore the wreck of the *Mahi* off Oahu. Right: A Kona sunset. Below right: Hula dancer. Bottom: Waikiki Beach and Diamond head.

photo/Art Smith







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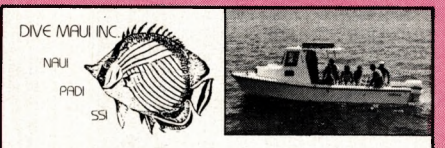
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HAWAII

feet, at Keka's Point in front of the Sheraton Hotel. This is a popular night dive from shore because it is virtually impossible to get lost. You simply get in on one side, follow the wall with the current (if there is one) and get out at the other end. Night diving is the time to see many of the creatures that make Hawaii special.

Hyatt Reef is a large shallow reef 10 to 40 feet deep in front of the Hyatt Hotel. The expanse of live coral is home to lemon butterflyfish, bird and saddle wrasses, turtles and an occasional manta ray.

Molokini Crater is a crescent-shaped island formed by the crater of a dormant volcano. About three miles from Maui's west coast, Molokini crater is a marine preserve. The outside is an almost sheer vertical wall with stunning visibilities of up to 200 feet. Keep your eyes open for large jacks, mantas and sometimes white-tipped sharks or humpback whales in the distant blue. A current can make the wall a spectacular drift dive.

Summerhouse is a large area on Lahaina's east side that has abundant live corals along the sloping 20 to 60 foot bottom. Tropical fish are abundant and you usually see hawksbills at this turtle breeding ground.

LANAI

Home of the only dedicated dive resort in Hawaii—HOTEL LANAI—the island of Lanai is delightfully rural and low-key. Owned by Dole Company, 15,000 of its 90,000 acres are covered with pineapple fields and much of the remainder is mountainous. You can hike; hunt; explore for petroglyphs with a jeep; play golf at the nine hole course; dive; sun on the large sandy beach; or simply read and rest. Daily commuter flights are available on Royal Hawaiian Air Service from all the other Hawaiian islands except Kauai. The pilot of the twin engine aircraft gave an enjoyable commentary during the flight. Hotel Lanai can arrange for a rental car or jeep to meet you at the airport.

Hotel Lanai can accommodate up to 6, 12 or 18 divers for boat diving at sites that are usually less than 30 minutes from Manele Harbor. You don't have to worry about missing breakfast or meeting a boat. The resort meal and boat schedules are organized around diving.

LANAI DIVE SITES

First Cathedral is beneath a huge wash rock by a reef of live coral, decorated with red slate-pencil urchins. The floor of this large cave reaches 50 feet. At one end the lattice work of lava rock forms several small openings that remind you of a large stained glass window as sunlight streams through.

Second Cathedral is a home for

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Moorish idols, several species of butterflyfish, ghost shrimp and numerous other undersea critters. It is a huge central cave with a large ceiling opening. There are five large side openings, one of which leads to a secondary cave with a ceiling opening and three side openings.

Nob Hill has several U/W ridges and archways, but the most interesting feature is a large slab of rock supported by several columns. It looks like a table set on top of an undersea pinnacle. Yellow cup corals line the dark interior .

Shark Fin Rock looks like a tall shark fin jutting up through the surface. We began our dive in shallow water, on a flat lava slab, and were immediately surrounded by tame lemon butterflyfish.

OAHU

Oahu has many faces and offers something for everyone. You can dine in high fashion; picnic on a remote beach; snorkel among hundreds of tropical fish in five feet of water; or scuba dive to a wreck 90 feet deep. You can drive over green mountains draped in waterfalls or watch entrancing hula shows on the beach. Sightseeing can include Chinatown and its open-air market and Shinto Shrine; the Polynesian Cultural Center with pageants and displays; Sea Life Park with dolphin acts; and the memorial over the sunken battleship, *Arizona*, at Pearl Harbor. The list of interesting things to do and see is almost endless. These all combine to make Oahu one of the most complete vacation destinations in the world.

Waikiki accommodations can be quite spacious and convenient. We stayed at the Royal Islander Club and Hotel, on the western edge of Waikiki, next to the open space of Fort De Russy Military Reservation and beach. Everything—from beach and fast food, to gourmet and fancy nightclubs—is within easy walking distance. You can have a studio/deluxe suite, with complete kitchen, sitting room and lanai, for a surprisingly low rate. The Royal Islander has dive packages with Aloha Dive Shop and South Seas Aquatics; write for details.

Oahu's full-service dive shops offer equipment sales with prices comparable to mainland prices, as well as rentals, diving and instruction.

ALOHA DIVE SHOP, a full service shop owned by Jackie James for the past 15 years, is in the Koko Marina Shopping Center, only 20 minutes from Waikiki. Once you park in the ample lot, everything you need is within easy walking distance. Jackie's new 32 foot customized Trojan, *Easy Diver*, is docked at the marina, only 150 feet behind her store. Carrying a maximum of only eight divers, *Easy Diver* makes the dive comfortable, fun and easy. Jackie also uses the 28 foot *Red Baroness*, a comfortable boat for small groups. Aloha Dive Shop has a dive/hotel package with the Royal Islander Hotel and a van pick-up service for

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HAWAII

dive charters.

HAWAIIAN DIVERS has new owners, Dorothy Banas-Bacon and Tommy Carruth and a new location on Salt Lake Blvd., between Aloha Stadium and the Honolulu Airport. A NAUI Pro and PADI Five Star facility, it teaches all PADI specialties except ice and cavern diver. Their ocean reef diver specialty, for example, features classroom sessions with slides and lectures about marine life and two guided dives.

In addition to boat dives, Hawaiian Divers offers a special day tour of the island with a shore dive and picnic lunch. Military divers are welcome and receive a military discount.

LEEWARD DIVE CENTER is a full service shop in Waianae, about an hour from Waikiki. They use three boats to take small groups to more than 50 sites and owner Pete Basabe is always exploring for more. He has recently added an all-day trip to reach Kaena Point to the north and Barber's Point to the south. Leeward Dive Shop has packages with the Makaha Plantation and Sheraton Makaha, both a few minutes north of Waianae, and can do Waikiki pick-ups.

OCEAN ADVENTURES, a full service dive shop in Pearl City, is owned and managed by Brad and Debi Revis. The store offers Turbo Tours with Tekna DV-3X Diver Propulsion Vehicles. Their giant, 16 and 22 foot Zodiacs, with canopy covers and twin 75s, are extremely comfortable for diving.

Ocean Adventures is a PADI Five Star Training Facility. Brad is a PADI ITC director. He offers instruction up to instructor, as well as PADI specialty courses.

Ocean Adventures also offers special interisland, overnight trips for groups of four to six divers. You motor to Molokai, fish on the way, dive and stay at a hotel on Molokai. They also have a package with Turtle Bay Hilton on the north shore—an excellent summer dive area.

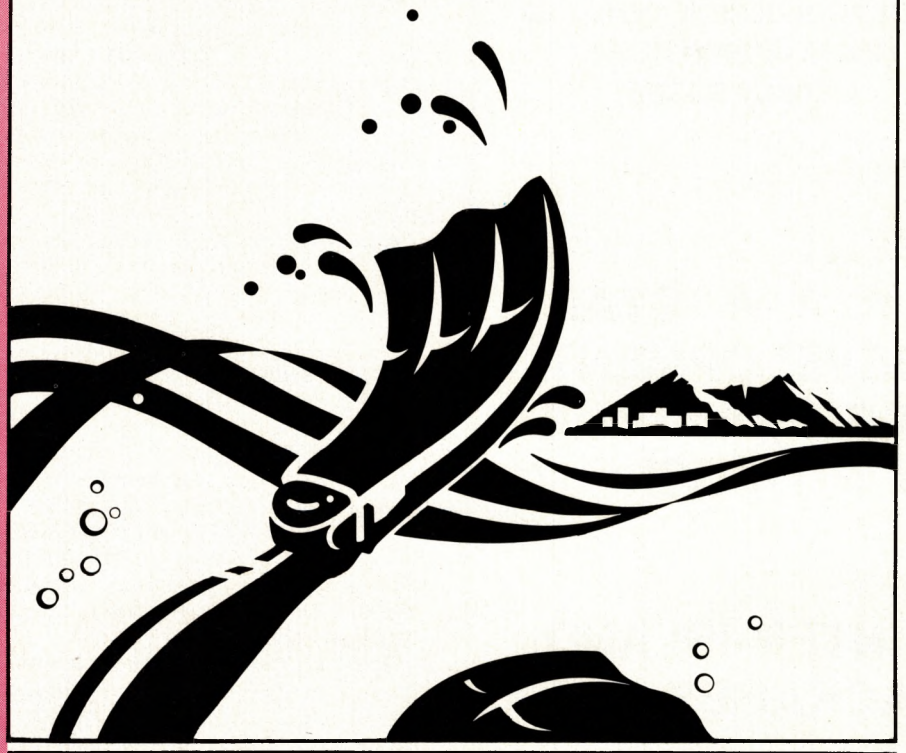
PACIFIC QUEST DIVERS, a full service dive shop owned by Zane Bilgrav and Joe Walsh, is in Kaneohe. During the summer, they keep their 25 foot, canopied Radon on the north shore to dive the beautiful sites from Kaena Point to Pupukea. In the winter, they launch at Waianae and other sites. They have a hotel package with Turtle Bay Hilton. Special outdoor adventure treks—where the staff carries the gear and does the cooking and you sleep in tents, cabins or condos—allow you to hike and snorkel or scuba in Hawaii's most remote corners.

SOUTH SEAS AQUATICS is the oldest full service dive shop in Oahu. On Ala Moana Boulevard, Honolulu, and owned by Ken Taylor, they have the largest dive boat on Oahu. The 44 foot Delta, *South Seas II*, based at Waianae, carries up to

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STEVE'S DIVING ADVENTURES is on Ala Moana Boulevard, in Waikiki. Owned by Steve Holmes, they take two to six divers each on their 22 and 28 foot boats, which are right at Waikiki. They pick you up at your hotel, take you to their full service shop for orientation and equipment, then to the boat. Because travel time to the nearby dive sites is short, you will have ample time for topside activities. Steve's also offers boat dives from Waianae and has guided shore dives to Hanauma Bay and the north shore.

OAHU DIVE SITES

During most of the year, the diving is best on the leeward (south) side of the island, from Kaena Point down to Hanauma Bay. In the summer, the diving extends to the north shore as well. The diving around Oahu is characterized by shallow, sloping lava flats, bordered by steep ledges and honeycombed with tunnels and arches. Many of Hawaii's special creatures remain hidden by day, so make a night dive to find crabs, Spanish dancers and other nudibranchs.

Hanauma Bay, a marine preserve on Oahu's southeast point, is Oahu's most beautiful and popular beach. A shallow barrier reef protects it from heavy seas. You will soon be surrounded by countless tropical fish whether you snorkel or scuba, especially if you bring some bread as food. This is a great place for the entire family.

Kaena Point is the farthest area to the north accessible by the boats based at Waianae. Huge boulders covered with red encrusting sponges and numerous lava tubes offer plenty of hiding spaces for lobster, giant sea turtles and eels.

Kahala Barge, a 200 foot barge scuttled to form an artificial reef, lies at 80 feet just a short distance from the *Mahi*. The intact wreck's pilothouse and fixtures are excellent props for U/W photographers and hordes of tropical fish are moving in.

Lahi Lahi Cave (Big Mouth Cave) is a huge cave open on three sides. Yellow cup corals line the ceiling and empty seashells can be found on the sand bottom. Bring a dive light to see the fish and other marine life in the cracks and crevices.

Magic Island (also called Rainbow Reef) is in front of Waikiki. For underwater photographers, this is a dream come true. Numerous tame fish—including surgeons, butterflies, triggers, spotted green puffers, bird and saddle wrasses—can be handfed and lured into your close-up framer.

***Mahi* Wreck** is a 165 foot minesweeper resting intact and upright in 90 feet of water. Just south of Waianae, the *Mahi* is an exciting wreck for exploration or photography. The schools of snappers, goatfish and lemon butterflies have staked claim to the *Mahi*. Bring some food and you'll attract a lot of attention.

Makaha Caves is a shallow—30 feet or less—site honeycombed with lava tube caves, grottos, archways and ledges. It features fascinating terrain and beautiful fish. Look for small critters hiding inside the rugged caves. Because of occasional heavy waves, however, don't look for fragile sea life.

Shark's Cove, in the Pupukea Marine Reserve on the north shore, has a labyrinth of lava tubes and ledges in 10 to 50 feet of water. Take a flashlight to explore the caves and the abundance of animals such as fish, crabs, lobsters and octopus.

Star Reef begins at 50 feet. You follow a ledge with arches and overhangs until you reach a spectacular lava dome with five large circular openings. The top is in about 15 to 20 feet of water; the bottom, at about 35. This is an ideal site for a fisheye lens.

Turtle Canyon, in Maunalua Bay, has

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a series of canyons in 30 to 40 feet of water. You can see plenty of turtles swimming or resting under the ledges. In late afternoon, when the turtles return from their feeding areas, it looks like Turtle International Airport as they glide down over the tops of the canyons.

THE KONA COAST

The Kona Coast is on the western shoreline of the big island of Hawaii, between Anaeho'omalu and Kealakekua Bay. We stayed at the King Kamehameha Hotel, in Kailua-Kona, near the center of the Kona Coast. The hotel faces a small but excellent beach and an extensively reconstructed Ahuena Heiau (temple) where King Kamehameha the Great once resided. By the Kailua Pier, the "King Kam" is within walking distance of Jack's Diving Locker, Kona Coast Skindiver, a grocery store and the waterfront shops and restaurants. Gold Coast Divers is in the ground floor mall. The Moby Dick Restaurant, one of three in the King Kam, offers excellent dining and service.

We've also stayed at the Kona Surf Resort, farther south on the rugged lava shoreline of Keauhou Bay, close to Sea Paradise's dive shop and boat. The expansive grounds are beautiful, the staff friendly and pleasant.

The Kona Makai oceanfront condominiums, one and one-half miles south of Kailua-Kona, combine the luxury of a resort with the comfort of a complete vacation home. You can enjoy a pool, spa and BBQ outside, and the convenience of a full kitchen and washer/dryer inside. Kona Makai is managed by Real Hawaii, with a dive package provided by Kona Coast Skindiver.

The five dive operators we visited were all concerned with providing professional service. They all want your repeat business, not just a fast buck.

FANTASY DIVERS is a dive charter service owned and operated by Jim Brennan. He can launch his 25 foot, canopied Aquasport at Keauhou, Honokohau or the Kailua Pier. Jim likes leisurely dive trips for up to six divers. The boat leaves about 9:00 am and returns between 2:00 and 3:00, depending on the pace set by the group. His catered lunches include such fare as stuffed avocados. He also offers overnight and multi-night sail/dive charters aboard the 41 foot Morgan Outisland, *Kahua O Mali'o*.

GOLD COAST DIVERS, a PADI Five Star facility in the King Kamehameha Hotel Shopping Mall, is a full service shop owned by Sandy and Steve Kaiser. Your room, restaurant, shops, dive shop and boat are all within easy walking distance. Their new boat, the 42 foot motor catamaran, *Kahola*, accommodates up to 12 divers plus snorkelers and riders. It has a crew of four. It is luxuriously appointed, with a complete galley and three staterooms with queen sized beds. Whale watching, comet cruises and overnight trips are planned for 1986. Their 26 foot

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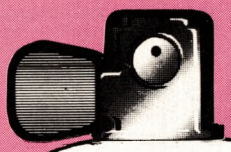
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Pegasus is used for smaller groups. Steve also has a 38 foot Sportfisher for combined diving and fishing trips.

JACK'S DIVING LOCKER is in the picturesque Kona Inn Shopping Village, about a quarter mile from the King Kamehameha Hotel. Tina Clothier, the owner of this full service shop, specializes in friendly service and instruction for small groups and non-scary introductory dives. She offers family trips by van to Place of Refuge. Non-divers can visit the historical Place of Refuge Park or snorkel while the divers enjoy two guided dives. Ease and convenience for the customer are Tina's main goals.

Tina uses the 24 foot *Blue Dolphin*, owned and operated by Teri and Jeff Leicher of Dolphin Divers. They know the area and will lead you to their undersea creatures. After the dive, they serve great cookies! They can also take you on manta ray and lava tube night dives.

KONA COAST SKIN DIVER, LTD., a full service shop with ample parking and a drive through airfill station, is operated by Julie and Jim Robinson.

At this writing, KCSD has a new 36 foot Radon, the *Diver One*, under construction. *Diver One* will have rinse tanks for camera equipment, forward lower cabin, shower, ample seating, camera storage area and step-off stern platforms. It will take up to 12 divers in comfort. For special trips for small groups, they use *Skindiver*, a fast, 25 foot canopied Radon.

Now, with a staff of eight, KCSD can serve the needs of beginning, experienced and advanced divers. KCSD has an air/condominium package through Real Hawaii. Accommodations are at the beautiful, oceanfront Kona Makai Condominium, with pool, spa and BBQ, less than two miles from Kailua-Kona.

CAPTAIN NEMO'S OCEAN SPORTS, owned by Mike Tansey, is at the beautiful Sheraton Royal Waikoloa Hotel, Anaeho'omalu Bay, north Kona Coast. Their boats come right up to the protected, secluded sandy beach, where you step aboard. Top of the line dive sites are only a few minutes from the beach.

Nemo's 42 foot sailing catamaran, *Me A'u*, is used for luxury excursions along the rugged coastline. They stop along the way for leisurely snorkeling and diving, followed by a full buffet lunch. The *Me A'u* is also used for two hour afternoon or sunset sailing trips.

SEA PARADISE, owned and operated by Steve Mahaney and Robin Barrett, is by the Keauhou Bay dock. In addition to their personalized service, their convenient location is an important feature: The boat is loaded and ready to go when you arrive; if you've forgotten anything, the shop is only 20 yards away. Their 31 foot Radon, *Sea Paradise*, has a spacious cabin and covered deck space with plenty of shaded sitting and standing areas, as well as forward and upper sundecks. Although certified for 16 divers, trips are usually limited to 12 divers with one divemaster for every four. And, for small special groups, their 30 foot *Nautilus* carries up to six divers.

Owing to their southern location, Sea Paradise can reach more than 50 dive sites in 30 minutes or less by boat.

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KONA DIVE SITES

Sheltered from the trade winds by twin volcanic peaks, Kona Coast dive sites enjoy excellent weather all year. Rivers of molten lava plunging into the sea have created an undersea labyrinth of submerged tunnels and archways for divers to explore. Visibility is usually excellent because there is virtually no agricultural runoff. Because the U/W drop-offs don't allow the building of tall waves, the Kona Coast supports a profusion of lush, colorful corals.

Aquarium, at the northern part of Kealakekua Bay, is home for zillions of tame yellow and unicorn tangs, saddle and bird wrasses, long-nosed butterflyfish, trumpetfish and a massive school of rudderfish. Many other fishes swim

among beautiful corals.

Kaiwi Point to Pine Trees, includes many dive sites just north of Kailua Bay. This area has large boulders strewn along the gradual slope from shore down to 130 feet. Look for manta rays, spotted eagle rays, big turtles, yellowfin tuna and eels your divemaster can handfeed. There are close-up subjects such as hermit crabs, frogfish, leaffish and octopus.

Kona Cathedrals, at Kaiwi Point, is truly breathtaking. Imagine a huge submerged room with shafts of sunlight piercing cracks in the large lava dome ceiling. It has two side openings, four skylights and a pillar in the center.

Pentagon, just outside Anaeho'omalu Bay, is a huge dive site, 15 to 40 feet deep. On the deeper side are several large ridges with variously shaped archways. In shallower water are several caves and tunnels, including one large cavern with five openings. Everywhere you look, colorful fish brighten the scene.

Red Hill, just north of Kealakekua Bay, is a mile long area loaded with lava tubes, archways, grottos and ledges that form many individual dive sites. The varied collection of fishes and cave dwelling creatures at these sites will thrill close-up and macro photographers. Also, look for sleeping sharks, octopus and majestic manta rays.

KAUAI

The garden island of Kauai is lush with flowered vines, trees and shrubs. This island of contrasts is home to the wettest rainforest on earth, as well as a desert canyon as beautiful as the Grand Canyon in Arizona. Kauai offers excellent hiking, camping, solitude, serenity and pretty beaches. You may have already seen parts of Kauai in movies such as *South Pacific* and *Blue Hawaii*. Kauai is uncrowded, the people are warm and friendly, and the aloha spirit is expecially apparent here.

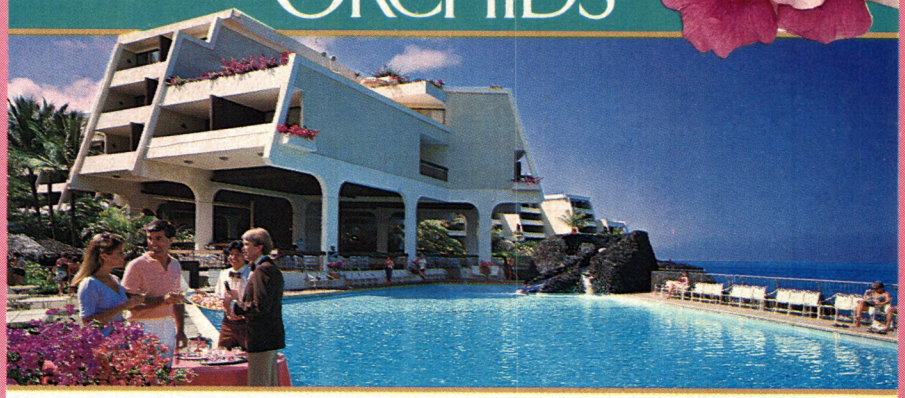
The dive operators discussed are all certified professionals who offer both instruction and diving for all levels of experience. They trailer and launch boats at the ramp closest to the dive site to reduce travel time.

AQUATICS KAUAI, LTD. is owned and operated by Pete Ricciardi, who has been leading Kauai dive tours for ten years. Pete is anxiously awaiting delivery of a new 38 foot Wilson, the *Ginnie Mae*. Sleeping eight comfortably, *Ginnie Mae* will make overnight trips to the island of Niihau. For day trips, depending on the group, *Ginnie Mae* can take up to 25 snorkelers, divers or riders. Pete will keep his present boat, a 26 foot Radon, for smaller groups.

Ricciardi is installing a complete lab for same-day color prints and overnight color slide processing for Kodak Ektachrome and other E-6 compatible films. He also has an U/W video service with same-day VHS or Beta copying, as well as video coaching.

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HAWAII

Aquatics Kauai has a dive package with Real Hawaii. Accommodations are at the Kaha Lina, a condominium resort on a white sand beach near Wailua.

FATHOM FIVE PROFESSIONAL DIVERS, owned and managed by Terry O'Halloran and Frank Adams, is by the Chevron station in Koloa. They give instruction up to ITC. Their shop, large classroom, gear lockers, boat and shopping are all five minutes from Poipu. Their 24 foot Radon, the *Aukai*, makes daily morning and afternoon trips for three to six divers. They also offer guided snorkeling trips and scuba diving from shore. Their dive packages, with all condominiums in Poipu, include a rental car. There are discount coupons—good for outside activities—as part of the package.

SEA SAGE DIVING CENTER, a newly remodeled, full service dive shop in Kapaa, is owned by Nikolas Konstantinou. Nik has family packages with such features as a free intro dive and baby-sitting. They have a snorkeling beach picnic where they give lessons on water safety, snorkeling, marine life and introductory scuba. They can arrange dive/room/car/airline packages—write for details.

Sea Sage's 21 foot Radon frequently operates out of Hanalei Bay, on the north shore. Sea Sage has dive packages with Pono Kai Resort, in Kapaa and Islander on the Beach, in Wailua.

KAUAI DIVE SITES

Kauai has three main dive destinations: the Wailua and Poipu areas, dived all year, and the north shore sites, available during the summer. The main features of Kauai diving are the lava formations and impressive numbers of fish, turtles, eels and black coral trees.

Ahukini Landing is a marvelous night dive when its numerous invertebrates—shrimp, crabs, Spanish dancers and other nudibranchs—come out of hiding.

General Store has a U-shaped ledge with three small tunnels. Look for the longnosed hawkfish in the small trees of black coral that adorn the ceiling of one cave at 55 feet. Large anchors and chains remain from early 19th century shipwrecks; after storms, artifacts can sometimes be found in the sand at 80 to 90 feet.

Koloa Landing has plenty of tame fish and small eels—including dragon morays—are everywhere. This shallow, protected shore dive site is great for introductory classes and beginning divers.

***Luchenbach* Wreck** covers a large area at about 30 feet. Photographers can pose models by the huge propeller or the coral encrusted anchor. The wreckage has attracted, and is home to, a myriad of tropical fish and several large eels.

The Oasis is a large lava pinnacle reaching up to within four feet of the surface from a barren sand and lava bottom 35 feet below. Large porcupine fish hang in midwater like barrage balloons.

Oceanarium, a north shore site, has rugged pinnacles and canyons from 65 to 140 feet. Visibility is excellent—often exceeding 100 feet. Large pelagics, such as jacks and tuna, sometimes play in divers' bubbles.

Sheraton Caverns are three giant submerged lava tubes that twist and wind through depths from 35 to 60 feet, with shafts of sunlight piercing overhead and side openings. You will almost always see turtles and lobsters in addition to reef tropicals. If you are adventurous, ask your divemaster to show you the sleeping whitetip shark that may be there.

CONCLUSION

There are still hundreds of things we wish to see and do in Hawaii and hundreds of dives yet to make. We enjoy Hawaii because the people there know how to show us a good time. And, we enjoy the diving because many of the creatures, especially the fish, are found only in Hawaii. Nowhere else can you see such beautiful coral, so many fish, enjoy such stunning mountain vistas, try so many new cultural events and still be in the United States!

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Seatec Original Manta B.C.

As Sturdy And Sleek As Its Namesake

BY JIM WALKER



There are several models of Seatec's Manta buoyancy compensator to choose from, but the Original is the most unique and the model that inspired the name Manta: Spread out open, it has a shape reminiscent of the manta ray. As the manta ray's shape offers low resistance to motion through the water, so does the Manta BC. Its low profile design hugs the body in comfort while offering plenty of buoyancy.

The most obvious difference between the Original Manta and the other models is the absence of air chambers over the front of the shoulders. Some may find this look less aesthetically pleasing. I did, but as soon as I tried the Original on, I found the look becoming real "me." That's because it slipped on like a familiar coat, enclosing my chest as if custom designed. Meanwhile, my arms were as free as if I'd been wearing a knapsack. And, on or off, the Manta felt sturdy—like it was built to last a long time.

The Manta BC is made of rugged 420 denier nylon fabric. The fringes are protected with double sewn nylon edge taping. Stress points are reinforced with extra stitching and, in some cases, sewn-on panels of PVC coated fabric. The inner bladder (zipper accessed) is custom compounded urethane. It is divided by baffling into chambers that prevent air shifting in the BC underwater and allow the jacket to mold itself to body contours.

The major design innovation that the Original has in common with other Manta models is the soft backpack. Sewn inside the back of the BC is a flexible nylon sheet. This adds the strength necessary to support a tank without the bulk and hard edges associated with normal packs. It is extremely comfortable topside or underwater. Two nylon webbing bands secure the tank to the backpack. These close with stainless steel snap-over buckles. The bands are adjusted by means of fold-over Velcro® flaps and plastic sleeves on the bands help prevent tank slippage. A sheath of double layer nylon fabric (with padding between the layers) wraps around the tank with the bands, adding stability. The sheath is integrated into the BC, cradling the tank between air chambers. A nylon webbing carrying handle is attached to the backpack.

The shoulder straps of the Manta are tough nylon webbing. They are adjustable and covered with neoprene sleeves for comfort and reduced wear on wetsuit shoulders. Thick pads, sewn into the shoulders of the BC, provide additional comfort. Other adjustments include the buckle closing waist band; snap-in chest strap; and padded, Velcro closing, cummerbund-style body band.

The Manta features a manual/power inflation hose attached to the left shoulder. A combination overpressure/dump valve is on the right shoulder. Drawstring operated, it allows quick, one handed deflation. There are two Velcro closing, grommet drained pockets. The right hand pocket has a stainless steel D-ring inside for attaching keys and the left pocket covers the CO_2 inflator. The threads of the inflator mechanism are noncorrodible, glass reinforced plastic. Thus, minor corrosion of a CO_2 cartridge won't freeze it into the mechanism.

photos/Bonnie J. Cardone

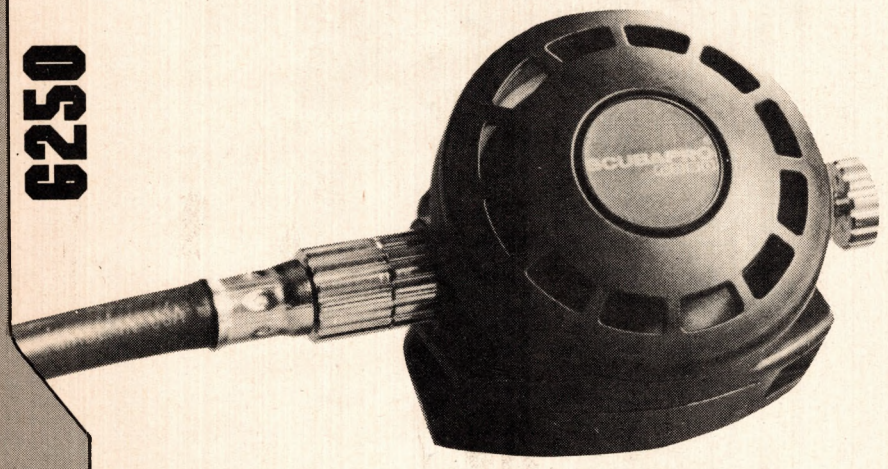


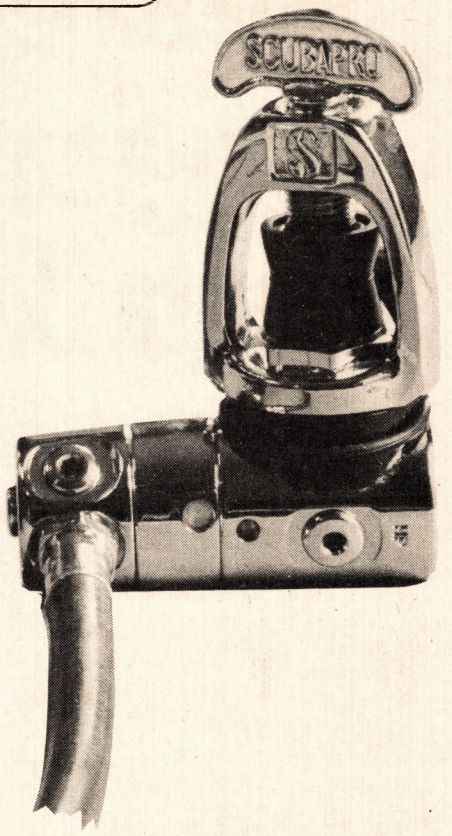
Spread out, the BC resembles the ray.

Two stainless steel D-rings are at the bottom of the BC and there are five Velcro closing hose guides—one on each shoulder, one above each pocket and one on the back of the BC next to the tank sheath. These allow great flexibility in positioning gauge and octopus hoses.

The Original Manta BC comes in several color combinations: navy/red, navy/royal blue, navy/silver, black/yellow and all black. The inner bladder comes with a lifetime warranty for the original owner. The Manta sells for $374. Let one impress you at your Seatec dealer.

Scubapro's G250





G250

TEXT AND PHOTOGRAPHY BY ERIC HANAUER

When we last visited Scubapro (SDM, November 1985) they had just introduced the Balanced Adjustable second stage, an update of their venerable regulator, around since 1965. Clearly this isn't a company that makes changes just for reasons of fashion. Imagine our surprise when they unveiled its successor at the DEMA show less than a year later. Retaining only the poppet mechanism from the Balanced Adjustable, Scubapro's G 250 is completely new, from its plastic housing to its revolutionary airflow adjustment. This is the only regulator that allows the diver to customize venturi assist as well as cracking effort: It is the first fully adjustable second stage.

Has Scubapro given in to the theory of planned obsolescence? Not really. The Balanced Adjustable is still available for those who prefer a metal housing. However, space-age plastics are definitely the wave of the future. The G 250's case is molded from a rugged fiberglass-reinforced polyester, which offers several advantages over chromed brass. First, it is five ounces lighter. Although brass is quite corrosion resistant, stainless steel screws set up an electrolytic action that eventually breaks down the metal.

Finally, the cost of manufacture and replacement is lower. Eventually the G 250's case may show scratches and gouges from bumps against hard objects in your dive bag. Don't worry; you can still look good in U/W photographs: The case can be replaced for one-third the cost of a metal one.

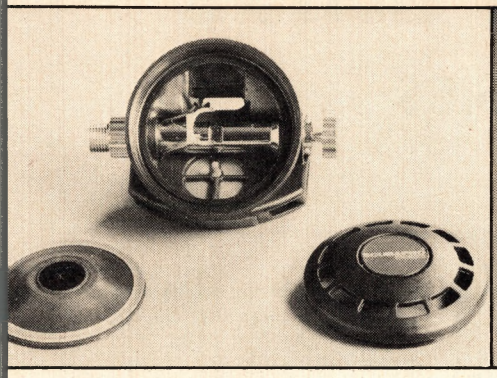
The exhaust tee is a part of the housing—no more rubber parts to get lost. The silicone diaphragm is electric blue, as is the logo on the front. An octopus is available with an orange diaphragm and mouthpiece and a four inch longer hose.

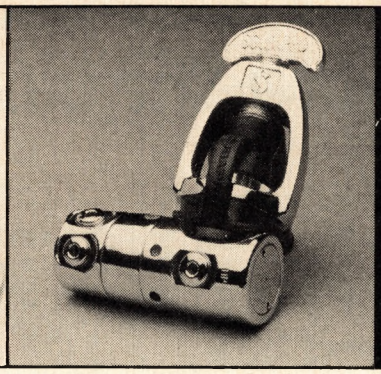
But the attractive housing is only the frosting on the cake. The big news is the total control of breathing effort offered to the diver. Until now, every regulator was a compromise between maximum airflow—needed only when working hard in deep water—and avoidance of air-wasting freeflow.

Some manufacturers addressed the problem by offering control of cracking effort—the amount of vacuum required to start the airflow. Scubapro used this approach with the Adjustable and the Air I. However, cracking effort is only one component of breathing effort. The other is aspirated flow, or the velocity of airflow after the poppet opens. The G 250 is the first regulator to allow individual adjustment of both components.

Dean Garraffa, the engineer who designed the G 250, explained how the system evolved. Originally, he was assigned to develop an update kit for the Adjustable Second Stage, which would give it more airflow by adding a balanced poppet. Pneumatic balancing is accomplished by allowing the incoming air to push equally on both ends of the poppet. This is achieved by drilling a small hole through the poppet and stem, trapping air in a small chamber. This air pushes the poppet back toward the downstream force, cancelling most of its effect. The balanced poppet allows smooth, easy airflow even when tank pressure drops below 1,000 pounds. A lighter spring is used to keep it closed, reducing wear on the rubber components. Spring tension can be changed by turning the splined knob on the left side of the regulator, thus controlling cracking effort.

As the project developed, the Scubapro staff realized they had produced more than an update kit. This was an entirely new regulator. Thus, the Balanced Adjustable was introduced as a mid-year





The G 250 (far left) allows the diver to adjust venturi assist as well as cracking effort: It is the first fully adjustable second stage. The exhaust tee is part of the case and the diaphragm is silicone rubber. The knob on the side of the case adjusts cracking effort. A plastic tab near the mouthpiece (not visible) adjusts the venturi assist. The G 250 and Mark X first stage (left) combination is offered at a savings over both units purchased separately.

addition to the line. However, Garraffa realized that breathing ease and comfort could be carried one step further. Most regulators have a flow vane in the mouthpiece tube, which is positioned directly in the path of the aspirated air. This deflects the airstream and changes its intensity. If the vane is set so the airstream blows directly out of the mouthpiece, a maximum venturi force is generated. This high velocity air pulls the still air inside the regulator along with it, causing a partial vacuum inside the case. This acts as a power assist, reducing the inhalation effort required to keep the diaphragm drawn inward. Scubapro uses the acronym VIVA (Venturi Initiated Vacuum Assist) to describe this dynamic air motion principle.

There is only one problem. If the flow vane is set for maximum venturi assist, the regulator would freeflow violently when removed from the mouth. Garaffa's solution was an adjustable flow vane. Its angle can be controlled by the diver to completely override the resistance of the valve mechanism (maximum boost) or to cancel the assist altogether (minimum boost). There is a patent pending on this exclusive feature.

Garraffa explained that maximum boost is necessary only when diving deep or working hard.

We tested the G 250 while beach diving in Scripps Canyon near San Diego, California. For surface swimming, both the splined knob and the flow vane were cranked down. The regulator acted like a rock. Even when dropped with the mouthpiece up, only a few bubbles escaped weakly and they stopped by themselves. When opened all the way, a violent freeflow erupted that continued even after the mouthpiece was lifted out of the water. It stopped only when I put my thumb over the mouthpiece.

I set both controls to maximum boost on descent. Breathing was free and easy, with a natural feel. Regulators with high cracking resistance have a mechanical feel; this one breathed as easily as walking down the street. There was no freeflow or leakage while descending, just a slight spray. The same was true on my back looking upward: There was a slight spray, accompanied by harder breathing.

In the normal prone swimming position, breathing was effortless. I turned the venturi assist off and on, just to note the effect, and was really able to feel the difference. The second stage must be removed from the mouth for this adjustment, especially when wearing gloves.

Gently sipping air is one of the most difficult tests for a sensitive regulator. Some stutter, others seem to pump air into your lungs. The G 250 flowed smoothly and gently. During hard swimming and hyperventilation, no trace of air starvation was felt, even at 120 feet.

Clearing the regulator required just the slightest puff of air. The purge button is overkill, releasing a powerful blast. When the regulator is removed from the mouth with the mouthpiece up, a violent freeflow occurs that stops only when you turn it down and shake it. With minimum boost there is still a strong freeflow, but it can be stopped more easily. Freeflow can be prevented, even on maximum boost, by turning the mouthpiece downward immediately as it is removed from the mouth.

When using any sensitive regulator, it is extremely important to watch your submersible pressure gauge. The G 250 is so finely balanced it delivers air effortlessly all the way to the end of tank capacity. The warning of restrictive flow over the last 500 pounds is not present. However, air continues to be supplied as ambient pressure drops on ascent, the same as with any good regulator.

In tune with its new technology, the G 250 carries a number instead of a name. The G is for Garraffa, 250 is just a model number. That may not sound as impressive as Tornado II, but neither does 911, and that hasn't hurt Porsche.

Mated with the Mark X first stage (SDM, November 1985), the G 250 sells for $310, a savings of $20 over the price of both components bought separately (and $10 less than the Balanced Adjustable). This is a new marketing strategy for Scubapro, which formerly did not offer deals on combinations. For more information, see your dealer or contact Scubapro, 3105 E. Harcourt, Rancho Dominguez, California 90221.

G 250

Mark X First Stage:	
Type	Balanced piston
Materials	Chrome plated brass body, Teflon seat
Weight	31 ounces
High pressure ports	Two
Low pressure ports	Five, on swivel
Intermediate pressure	128-140 psi
Flow at 2,000 psi	80 scfm (2,265 liters/minute)
Flow at 300 psi	73 scfm (2,067 liters/minute)
Environmental protection	Standard
Warranty	Limited lifetime
Price of first stage	$130
G 250 Second Stage:	
Type	Balanced linear flow demand valve Adjustable cracking resistance Adjustable venturi assist
Materials	Case: Fiberglass reinforced polyester Diaphragm/exhaust valve: Silicone Seat: Neoprene
Weight (without hoses)	9.52 ounces
Max. intermediate pressure	165 psi
Average flow	3.25 scfm (920 liters/minute)
Average inhalation resistance (surface)	1.2-2.0"
Average exhalation resistance (surface)	0.4"
Hose length	28" (32" octopus)
Warranty	Limited lifetime
Second stage price	$200
Combined price (Mark X/G 250)	**$310**

SDM's U/W Photo Class

Let's Review The Basics

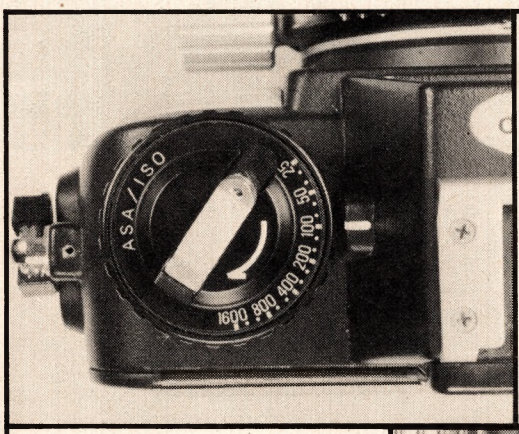
TEXT AND PHOTOGRAPHY BY JIM AND CATHY CHURCH

If you have been using a "point and shoot" automatic camera, you can take pictures without knowing much about the basics. But if you intend to use a camera with adjustable controls—such as a Nikonos or housed 35mm single lens reflex (SLR) camera—you need to know a little more. Don't panic—we'll skip the mathematical theories—you only need a working knowledge of camera controls and film speeds. At this point, go get your camera so you can examine the appropriate parts as you read.

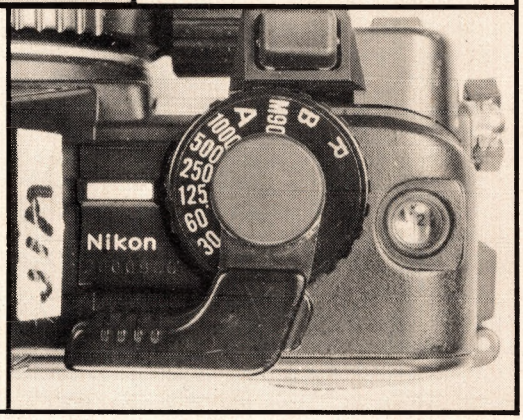
What is an exposure? A picture begins when the film inside your camera is exposed to light. The light bounces off your subject, passes through the camera lens and strikes the film. Film requires a specific amount of light for the exposure and this amount of light varies with different kinds of film. Basic camera controls—such as f/stops, shutter speeds and film speed settings—regulate the amount of exposure to light.



Film speed is sometimes included in the name of the film (i.e., Kodacolor VR 100).



The film speed dial on the camera must be set for the ISO speed of the film used. Here dial is set for 100. VR 100 film would be a good choice for this setting for color prints. Films with lower ISO numbers are slower (i.e., less sensitive to light), thus wider apertures or slower shutter speeds must be used. With some cameras, as the film cartridge is inserted, it automatically sets film speed.



For manual exposure control, you must set the shutter speed dial for a particular shutter speed, such as the 1/125 second shown. Higher numbers on the dial indicate faster shutter speeds (i.e., 500 is 1/500 second—only half as long as 1/250 second. When the dial is set for A the camera automatically sets the shutter speed. On B (bulb) the shutter stays open as long as the release is pressed.

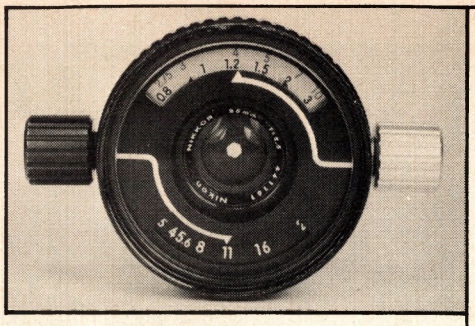
What are f/stops? If you can remove the camera lens, do so. Then, look through the lens as you operate the aperture control. You will see the aperture (the diameter of the lens opening) get larger and smaller. If your camera is a 35mm SLR, hold the auto aperture lever (at the rear of the lens mount) so the aperture blades will open and close. When the opening is small, the aperture scale will show a high number such as 16 or 22. When the aperture is wide, the scale will show a low number such as 2.5 or 4. These numbers are called f/stops (and sometimes f/numbers). F/stops merely indicate how much light can pass through the lens during any given time.

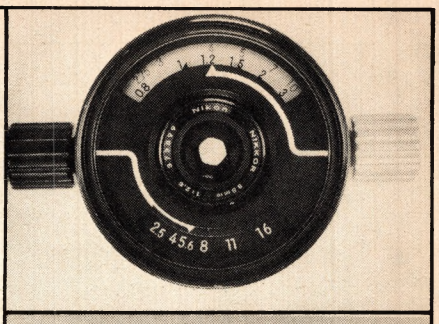
As you operate the aperture control, you will notice two important things: (1) The higher the f/number, the smaller the aperture; and, the lower the f/number, the wider the aperture. (2) The diameter of the aperture keeps changing even when the indicator is between the f/stops marked on the scale. Thus, you can use settings between the f/stops shown on the scale. A setting between f/8 and f/11, for example, is written as f/8-11.

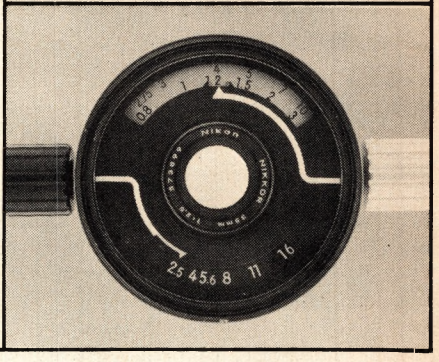
Each consecutively lower-numbered f/stop lets in twice as much light (during any given time) as the preceding f/stop. Thus, f/16 lets in twice as much light as f/22, and f/11 lets in twice as much as f/16. Likewise, each consecutively higher-numbered f/stop lets in half as much light as the preceding f/stop. Thus, f/22 lets in half as much light as f/16.

What is depth of field? As you operated the aperture control, you probably saw the depth of field indicators moving. With most Nikonos lenses, the indicators are a set of pincers that open and close on the distance scale. These indicate depth of field—the distance range in front of the camera that will be acceptably sharp in your picture. One indicator shows the near limit, the other the far limit. Subjects that are closer than the near limit—or are beyond the far limit—will be blurred. Generally, you wish to maximize depth of field to reduce blur in the near and distant picture areas.

The amount of depth of field is related to aperture, the distance setting and picture area. Look at the depth of field scale as you set the aperture control. You can see depth of field increase with the high-numbered f/stops, and decrease with the low-numbered f/stops. Now, set the aperture for a middle-range f/stop, such as f/8. Vary the focus (distance) adjustment and see how depth of field increases with longer distance settings. If you have more than one lens, set each for the same dis-







Left: When the Nikonos 35mm lens is set for an aperture of f/11 and a focus distance of four feet (top row of numbers), depth of field (the area in focus) extends from about 3¼ feet to more than 6 feet out from the lens. Note pincers near 3 and 6. Upper right: When the Nikonos 35mm lens is set for the wider aperture of f/5.6 and four feet, depth of field extends only from about 3½ feet to near five feet. Lower right: At f/2.5 and four feet, depth of field is only a few inches. Notice that as the aperture number decreases from f/11 to f/5.6 to f/2.5, the aperture opening in the lens becomes larger. Thus, the lower the aperture number, the more light passing through the lens. The trade-off is decreasing depth of field. Of course, the depth of field at any aperture depends on the focal length of the lens used. A 35mm lens has more depth of field than a 50mm lens.

tance and f/stop. The lens with the shortest focal length—such as a 28mm lens compared to a 35mm lens—will have more depth of field. This is because the larger the picture area that the lens sees, the greater the depth of field.

What are shutter speeds? The shutter speed is the duration of the exposure. Some typical shutter speeds are B (bulb—the shutter stays open as long as you depress the shutter release), 1/30, 1/60, 1/125, 1/250 and 1/500 second. High shutter speed settings produce sharper pictures than slow shutter speeds because the camera and/or subject are usually moving when the exposure is made. If you are using an electronic flash, the shutter speed must usually be 1/60 or 1/90 second. If you are taking sunlight pictures without the flash, use 1/60 for still subjects and 1/125 or 1/250 for moving subjects.

Whenever you manually set the shutter speed, you must use one of the settings marked, such as 1/30 or 1/60 second. With manual control, you can't use a setting between two shutter speed markings. Whenever the camera is set for A (auto), you set the aperture and the camera automatically selects the shutter speed. With auto control for sunlight exposures, the camera may select a shutter speed between two standard speeds.

Starting at 1/30, each time you increase the shutter speed setting to the next higher speed, the amount of light that can pass through the shutter is cut in half. Thus, the aperture must be opened by one f/stop each time the shutter speed is increased. Likewise, starting at 1/500 second, each time you change the shutter speed setting to the next lower speed the amount of light that can pass through the shutter is doubled. Thus, the aperture must be closed by one f/stop for each reduction in shutter speed.

What are film speeds? A film speed is a number that indicates how much light must strike the film for a correct exposure. Film speeds are also expressed with an ISO (International Standards Organization) or the older ASA (American Standards Association) number. The speed for any particular film is often included in the film's name. As examples, Ektachrome 100 has a film speed of ISO 100. Ektachrome 200 has a film speed of ISO 200.

If you are using an automatic camera, you must usually set the film speed dial on the camera for the speed of the film. However, with some cameras, the film cartridge is designed to set the camera for the correct film speed when you insert it in the camera.

The higher the film speed, the less light the film requires for an exposure. Each time the film speed is doubled, the film needs half as much light for an exposure. As examples, ISO 400 film requires half as much light as ISO 200 film, and ISO 100 film requires half as much light as ISO 50 film. Thus, fast films (those with high film speeds) are often used when there isn't much light available.

Generally, the lower the film speed the finer the grain of the slide or negative and the better the colors. Grain looks like tiny specks in the picture. Generally, grain is more noticeable in prints than in projected color slides.

The grand trade-off. Ideally, we would like to use high-numbered f/stops to gain depth of field, fast shutter speeds for picture sharpness and low film speeds to minimize grain and enhance colors. However, you may not have enough light to gain in all three areas. Changing the aperture, shutter speed or film speed involves a trade-off with one or both of the other exposure controls. As examples: (1) Using higher-numbered f/stops to gain depth of field may force you to use slower shutter speeds or higher film speeds. (2) Increasing shutter speed to gain picture sharpness may force you to use lower-numbered f/stops or higher film speeds. (3) Reducing film speed to reduce grain and get better color may force you to use lower-numbered f/stops or slower shutter speeds.

Close-up photography with a powerful electronic flash usually requires the least amount of trade-off: You can often use f/16 or f/22 to maximize close-up depth of field and ISO 25 or 64 film for maximum picture quality. Long-distance U/W photography with weak sunlight usually requires the greatest amount of trade-off because of the dark conditions.

TESTING YOUR UNDERSTANDING

Problem: You are buying film for a photo trip to Grand Cayman. You have a new Nikonos camera, 35mm lens and strobe, and wish to start with diver and fish pictures taken at about three to five feet. The instruction sheet with your strobe indicates that f/8 and 1/90 second would be a typical exposure at four feet with ISO 100 film. What ISO film speed do you need?

Solution: Set your camera lens for f/8 and four feet, and look at the depth of field indicators. Depth of field will only be from about three and one-half to five feet—less than two feet! Can you estimate camera-to-subject distance accurately enough for proper focus? If you buy ISO 200 film, you could expose at f/11, which increases depth of field to about three to six feet. Thus, errors in estimating distances, or having both near and far subjects in the picture, will result in fewer blurred pictures. Buying ISO 400 film increases depth of field even more, but picture quality begins to decline. Let your depth of field requirement be your guide and choose your film speed accordingly.



The Donzi Z-29

TEXT AND PHOTOGRAPHY BY STEVE LUCAS

Sitting upright on the bottom, almost 100 feet down, Fort Lauderdale's most famous wreck has attracted a large number of followers. Just a mile off the beach, the *Mercedes* has become home to thousands of aquatic inhabitants. On any weekend, their home is likely to be visited by several dozen boats and several hundred divers.

When we pulled away from the dock with Pete Marzano of Twin City Marine in Dania, Florida, I was dreading the ride. The sea was choppy and it is a long trip from the Port Everglades inlet to the *Mercedes*; one-half hour or more. If you're not in the Donzi Z-29, that is.

A sleek aquatic runner, the Z-29 has twin 260 or 300 hp Mercruisers. And, if you've got the spirit, the boat's gauges will gladly indicate speeds of 60 miles per hour! It is in a class with a Mercedes (as in Benz), with the eye catching looks of a Porsche and the ride, appointments and attention to fine detail built into a Rolls Royce. Plus, the Donzi makes the run to the *Mercedes*, or any place you might like to go on water, in one-third (or less) the time you would expect in a similar sized outboard.

Although it has an Italian sounding name, this luxury dive boat's pedigree is all American. Built near Tampa, Florida, Donzi's promotional material says the boat "is built for an owner who will simply never compromise for anything less than the very finest Donzi is perfectly content to let the giant boat companies crank them out by the thousands, cookie-cutter fashion. Donzi's goal is to build the very finest, not the best seller." After playing with one for a day, we couldn't find one reason to argue!

The 28 foot 4 inch Z-29 is a relatively new addition to the line. The company is not noted for bringing out "brand new in every way" boats. It is perfectly content with striving to achieve piece-by-piece, bolt-by-bolt, refinements for existing products—unless, of course, something really outstanding comes off the drafting tables in Donzi's quest for the ultimate boat. The Z-series is the next generation in that quest. The result is a boat that continues the Donzi tradition of one of the highest resale values in the market.

The Z-29 takes two to three times as long to build as compared with other boats of the same size. And, other than color and special props, there are practically no options; everything comes standard on all Z-series boats (there is also a Z-25 and a Z-33). A list of more than 41 items that would likely be optional on competitor's boats helps bring this craft to the level of a fine luxury automobile.

The boat's components are gauged only by function, quality and the prestige they add to the finished product. Example: The leather steering wheel is exactly the same type found on European Grand Prix racing cars. Its cost is several times that of a vinyl copy, but cost is not a consideration. Donzi has only one criteria:

DONZI Z-29

Length overall	28′ 4″
Beam	8′ 6″
Sleeping capacity	Two
Draft to keel	22″
Draft (outdrive)	34″
Freeboard forward	38″
Freeboard aft	30″
Gross weight	5,500 lbs.
Fuel capacity	125 gal.
Water capacity	18 gal.
Engines	twin 260/300 hp Mercruisers
Price (with 300 hp engines)	$82,995

Use the best available.

With premium grade hardware, the Donzi will look great years after others have begun to corrode. All seat bases are welded stainless steel with the bottoms designed to drop out so you can sit or stand comfortably with a heavily cushioned back brace. The lavish console is outfitted with all VDO blue line instruments and complete warning systems (the same instruments you'll find in Mercedes, Rolls Royce and BMW).

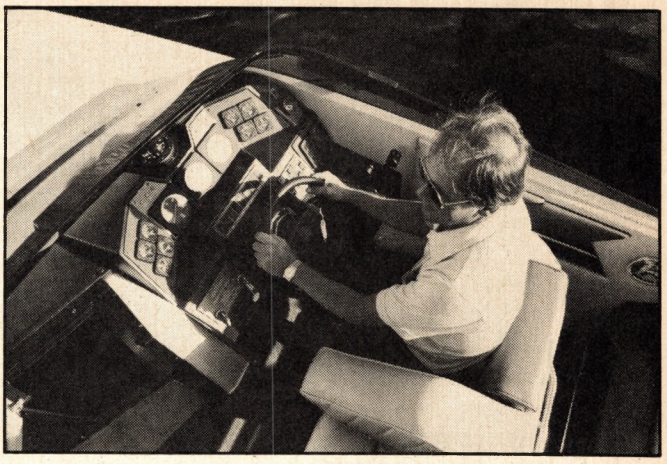
All switches are pressure sensitive and the entire electrical system has circuit breakers instead of fuses. Engine mounts and trim tabs are through-bolted (check other boats, you might be surprised to find how theirs are attached). The 110 volt shore power is standard, all carpet is snapped into place instead of stapled and a Kenwood AM-FM stereo system is built into every boat. To complete the package, all safety equipment required by the U.S. Coast Guard is included. In other words, when you take delivery of your Z-29 all you have to do is get in the cockpit, turn the key, turn on the music and go!

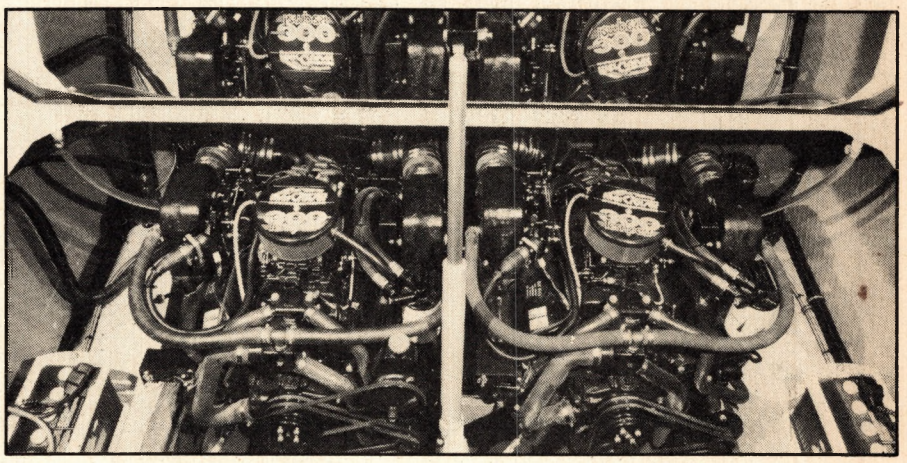
But there's more. With an entirely hand-laid fiberglass deck and deep-V hull, the Z-29 has enough fuel capacity in its 125 gallon tank to take you quickly and in high fashion to offshore dive sites. You can even make the Bahamas from South Florida in just more than an hour! At 5,500 pounds, even at high speeds, its hull sticks to the water and handles like a well designed racing machine.

The boat was designed with not only boaters, but divers in mind. Twin dive platforms are molded into the transom just aft the engine cover cushion. Down below, a leather upholstered V-berth provides room enough for two persons to stretch out. The low ceiling height does, however, make staying below deck a bit uncomfortable except for sleeping. In addition, there is an enclosed marine head, a small galley with 18 gallon freshwater capacity and refrigerator.

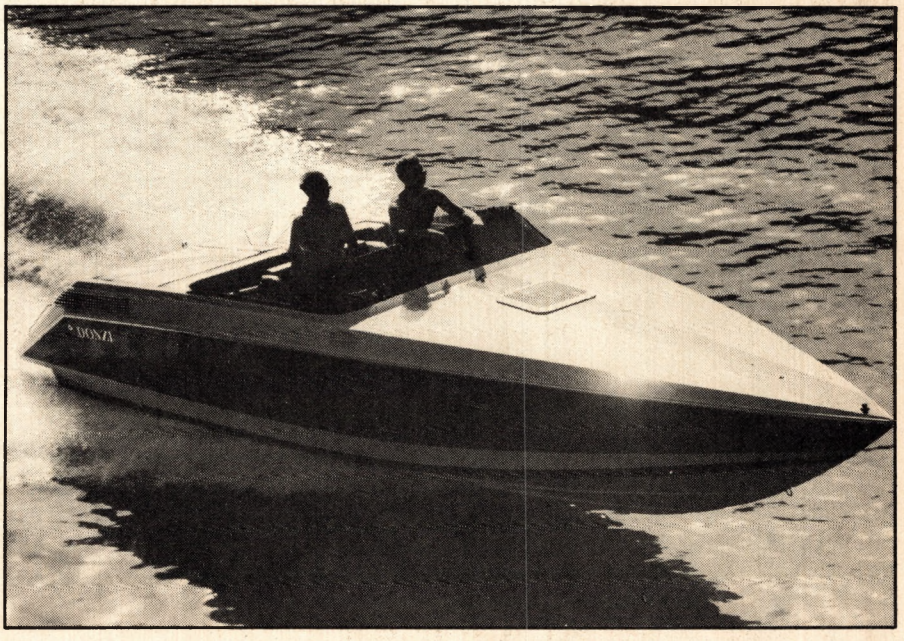
With such exceptional luxury appointments, the Donzi Z-29 comes with an equally impressive price tag. With twin 260 hp Mercruisers, the fully equipped, ready to run price is $74,995. With twin 300 hp Mercruisers, it is $82,995. When compared to boats in this general class that come stripped, the price is reasonable and within the range of many who "simply will never compromise for anything less than the very finest."

For the name of a Donzi dealer near you contact Donzi Marine Corporation, 7000 Bradenton Road, P.O. Box 987, Tallevast, FL 34270; (813) 355-9355. For a color catalogue featuring the Z-series send $5 with your request. In South Florida, contact Twin City Marine, 1495 Griffin Road, Dania, Florida 33004; (305) 920-6644.





The American made Donzi Z-29 has an overall length of 28 feet, 4 inches. With twin 260 or 300 horsepower Mercruiser engines, it can reach speeds as high as 60 miles per hour, enabling divers to reach favorite sites in much less time than in other boats. The lavish console is outfitted with VDO blue line instruments and a complete warning system. Seat bottoms drop out so you can sit or stand comfortably. Attention to detail and use of the best materials make the Z-29 "...built for an owner who will simply never compromise for anything less than the very finest...." A host of standard items on the Z-29 would be options on other vessels.



YAMAHA'S Counter-Rotating Twin 150's

Outboard Engines Of The Future

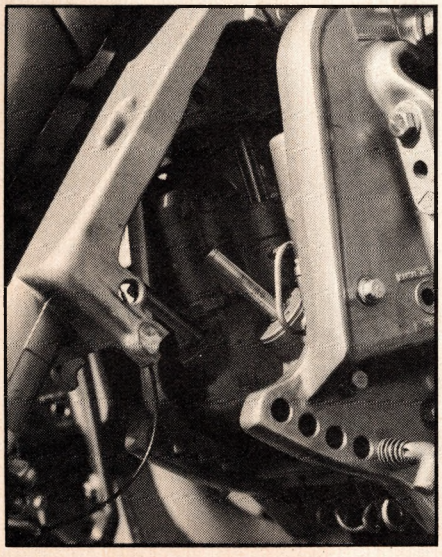
TEXT AND PHOTOGRAPHY BY FRED FISCHER



Skimming across the open ocean at nearly 50 knots in a 25 foot dive boat seemed like a dream come true. Areas too remote for routine visits now seemed within easy reach. Claude von Plato, owner of the boat, was eager for me to grasp the wheel and feel how easy it was to steer with Yamaha's newest innovation for the boating market, twin 150 horsepower outboard engines with counter-rotating propellers. Before now this feature was limited to inboard engine systems. As I took command and relaxed my grip, the boat continued to surge straight ahead. The Yamaha service manager had made his point, there was indeed no pull to the left associated with tandem propellers turning in the same direction.

Yamaha is the first to package dual outboard engines as an integral unit. The basic package includes two Yamaha 150 motors with counter-rotating propellers, power trim and tilt mounts, tie bar, dual binnacle control, dual engine switch panel, tachometer, oil tank and fuel tank. As a result, the same key will start either engine and a single, safety lanyard switch stops both engines if the operator loses control. A common warning system sounds an alarm buzzer and reduces the speeds of both engines if either is low on oil or overheating. A single switch on the throttle grip adjusts the trim and tilt of both engines simultaneously. Individual trim switches for balancing the engines are also present on the binnacle control.

The twin 150 engines have counter-rotating propellers and feature hydraulic tilt.



Close examination of the individual engines reveals features that enhance the performance. The block is a V6 design with the two rows of cylinders set at 90 degrees for the best mechanical balance. An offset crankshaft allows one cylinder to fire every 60 degrees for smooth operation. Lubricating oil is not pre-mixed with gas in the tank. Oil from an external tank is injected into the fuel after it leaves the carburetor by means of an oil pump driven by the crank shaft. As a result, the gas:oil mixture varies from 200:1 during idle to 50:1 at full speed. This feature saves on oil consumption and provides more oil when the engine needs it the most. Since oil does not pass through the carburetor, gummy oil deposits are eliminated. The cylinders are designed for loop charging where the gas mixture swirls into the chamber for improved mixing before ignition. The result is more power with less fuel and reduced engine wear. For corrosion protection segments of the engine are connected by wires for electrical neutrality and zincs are placed in the engine water jackets, transom bracket and above the propeller. In addi-

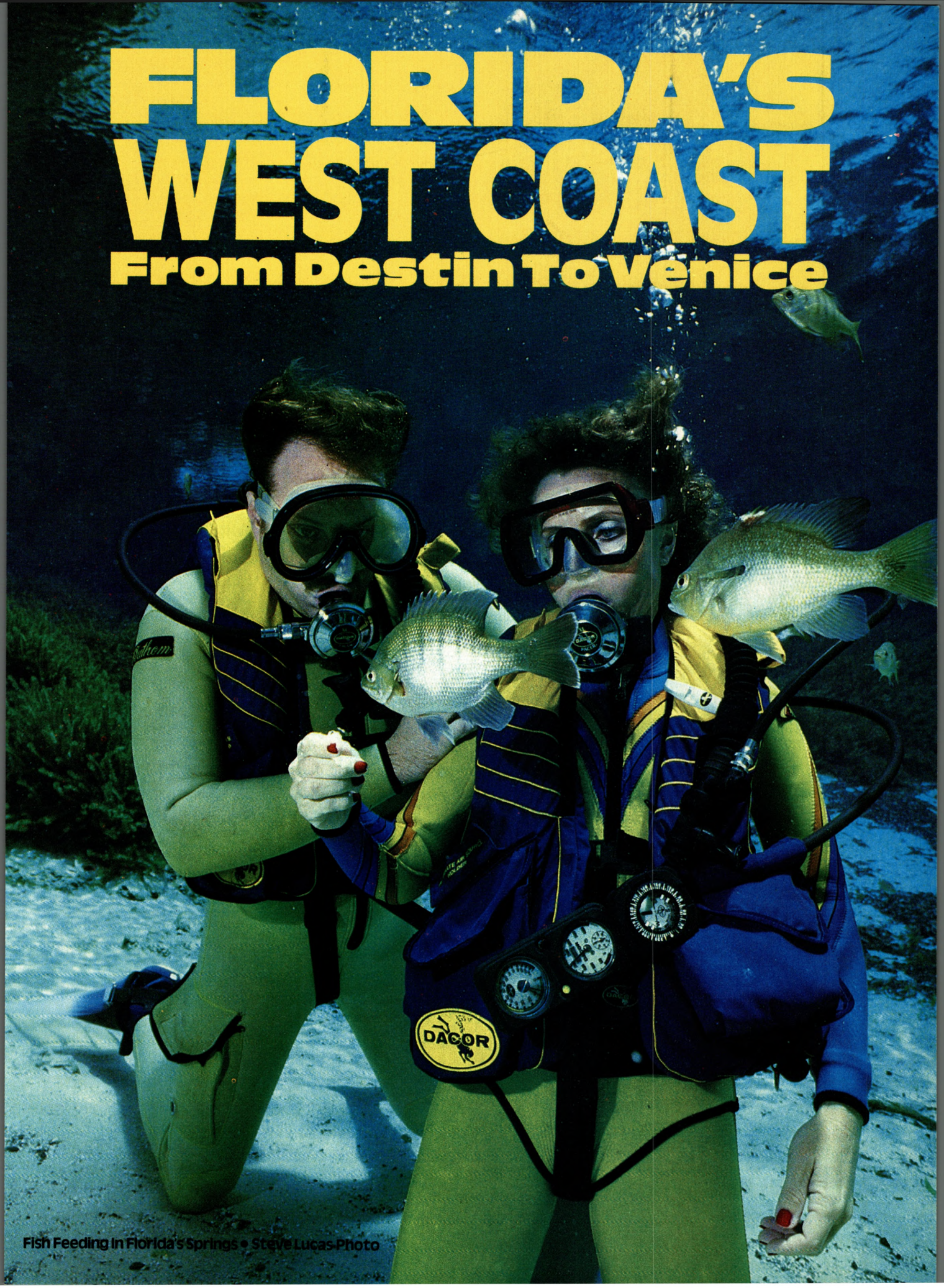
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YAMAHA 150

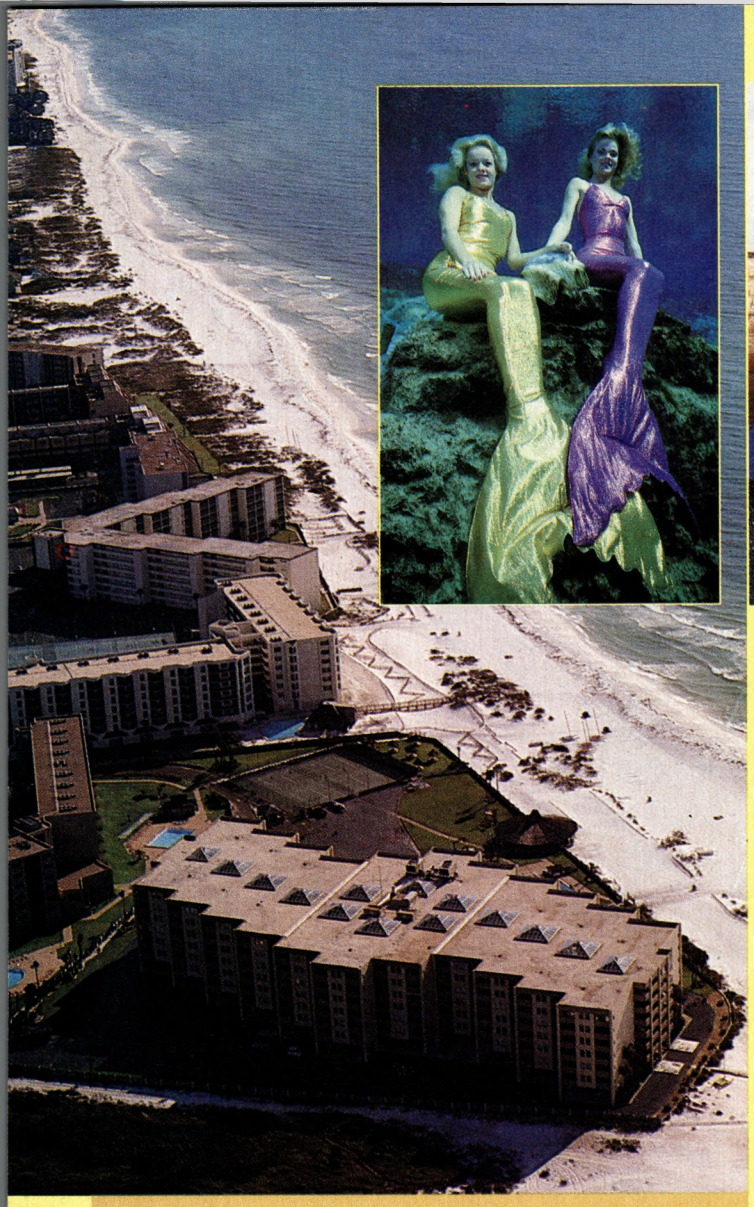
Engine type	V6 (90°)
Displacement	2,596 cc
Bore and stroke	90 x 68mm
Horsepower	150 at 5,000 rpm
Range of rpm	4,500-5,500
Compression ratio	5.8:1
Fuel charging system	Loop charged
Carburetion	Three (dual throat)
Fuel type	Regular (unleaded or leaded)
Lubrication	Precision Blend injection
Oil type	Yamalube
Exhaust system	Through prop
Ignition system	Capacitive discharge
Starting system	Electric
Shaft length	25"
Gear ratio	14:26 (1.86)
Weight	414 lbs.

FLORIDA'S WEST COAST

From Destin To Venice



Fish Feeding In Florida's Springs • Steve Lucas Photo





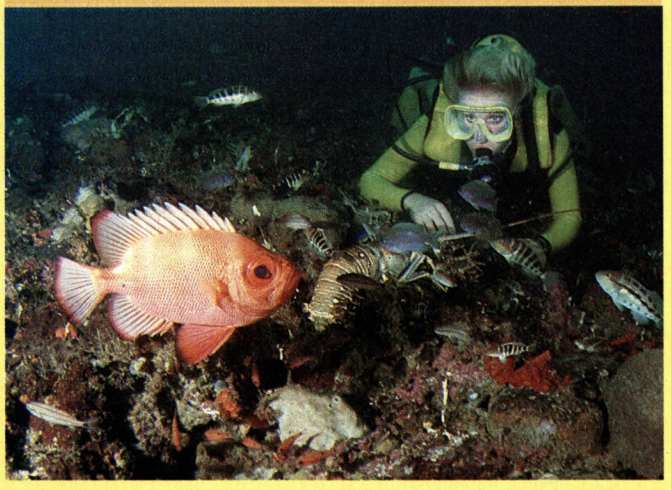


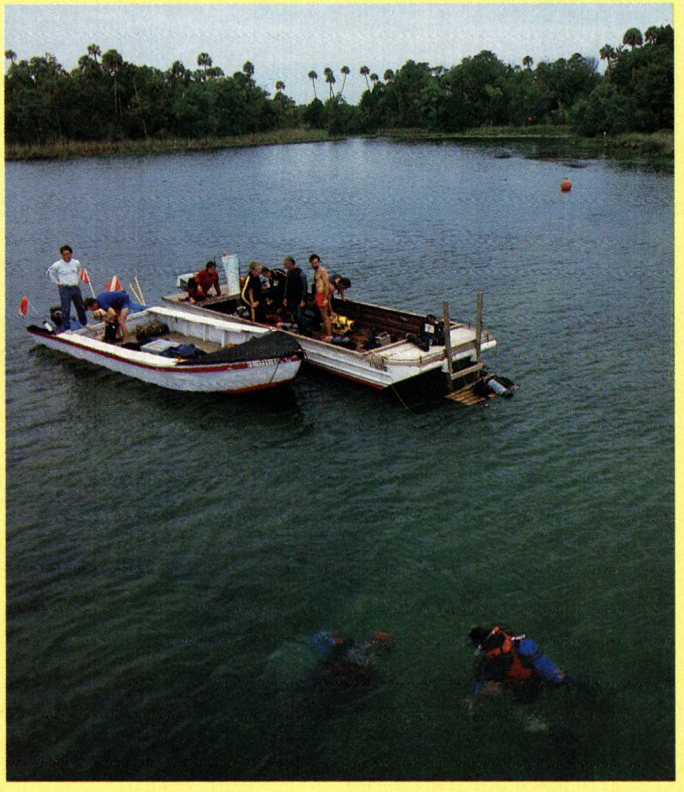
FLORIDA'S WEST COAST

An Exciting Combination Of Fresh Water And Ocean Diving

TEXT AND PHOTOGRAPHY BY STEVE LUCAS

Above: An aerial view of the beachfront at Destin. Across top: Weeki Wachee Spring "mermaids." Dolphin shows can be seen at the Gulfarium in Fort Walton Beach, Gulf World at Panama City Beach and Busch Gardens in Tampa. Windsurfing is popular along the gulf coast. Below: A diver confronts a lobster and bigeye near Destin. Right: Divers at King's Spring, Crystal River.





It's a place of sugar sand, sea oats and theatrical sunsets; of mermaids and manatees. It's a place of sea monster fish, of reefs, shipwrecks, emerald seawater and crystalline freshwater springs. It has roller coasters and sand dunes, leaping dolphins and a bit of the African plain; a dash of the tropics, a splash of the Caribbean. It can seem so, so far away. But it's right in your own backyard.

Passed over each year by thousands of vacationers searching for exciting diving, it's right beside the highways they drive to reach Florida's most promoted dive destinations. It is the largest, and the least dived, resort area in the state: Florida's Gulf Coast.

From the Emerald Coast of Destin/Fort Walton Beach to Panama City Beach around to the Sun Coast of Tampa, Clearwater and St. Petersburg: From the springs near Ponce de Leon to Branford, High Springs and Crystal River, the concentration of resort dive operators is second only to the Florida Keys. And, the number of good dive sites may actually outnumber those found in the southern parts of the state.

Known as one of the top vacation areas in Florida by those who just go in the water to swim, only in recent years have the excellent rock reefs and wrecks in the gulf begun to be discovered by divers. Just miles from the saltwater, unbelievably clear freshwater springs literally open out of the earth. In some, you can see your friends hundreds of feet away, manatees sometimes come close enough to play and, if you know where to look, you can see a swimming legend. Mermaids really do exist in one magical pool that eventually flows to the sea!

The easiest and quickest part of Florida to reach from most of the southern U.S., the Emerald Coast has a multitude of vacation attractions. Home to the Navy's precision flying show team, the Blue Angels, the Pensacola Naval Air Station has museums and displays open.

Fort Walton and Panama City each have large amusement parks with wild roller coasters, water slides and other zany rides. At Gulf World in Panama City and the Gulfarium in Fort Walton, the ocean puts on a show for everyone.

For the perfect suntan, the beach from Destin to Panama City is one of the softest and whitest in the state.

In Panama City, the Institute of Diving is set up to preserve the heritage of sport, commercial and military diving.

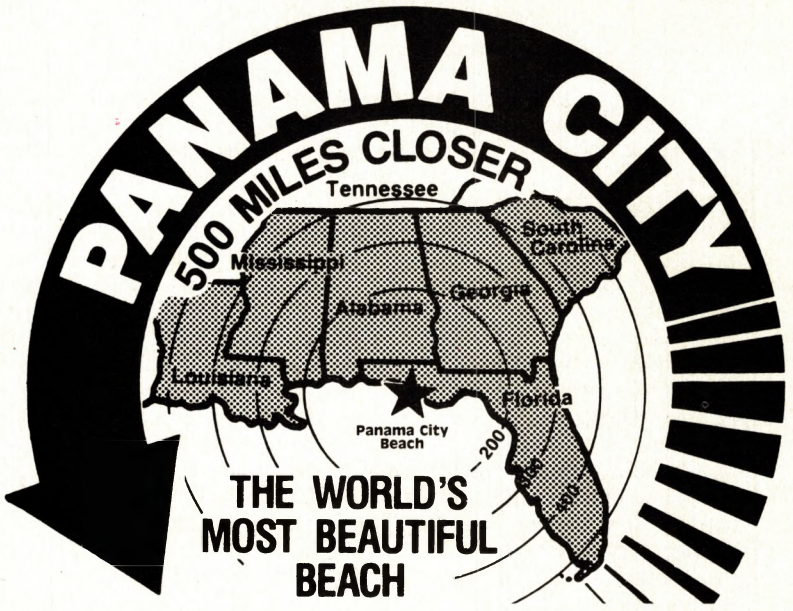
Near the Sun Coast, south of Crystal River, Homosassa Springs Nature World has thousands of fish in a glass walled natural spring.

One of Florida's most famous attractions, Weeki Wachee, puts on an exquisite aquatic ballet several times daily.

Less than an hour south, hardhat divers still work the sponge beds at the Greek fishing village of Tarpon Springs.

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a botanical wonderland displays more than 7,000 varieties of exotic plants and flowers. Fifty thousand flowers are planted annually to create one of the most beautiful gardens in Florida.

In Tampa, Busch Gardens' Dark Continent is built around the Busch brewery. In this 300 acre theme park, a part of Africa is recreated for your amusement.

As for Sun Coast beaches, those between Clearwater and Venice are among the nicest in the state.

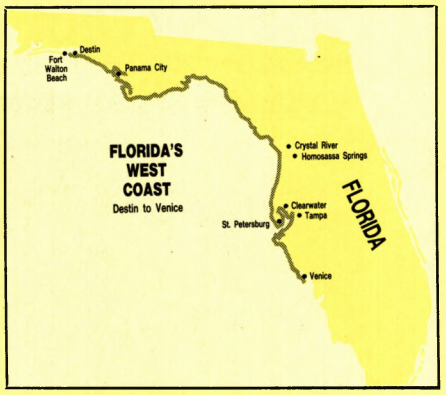
Divers have a large selection of sites and types of diving from which to choose. Near Destin, thousands of unexplored rock reefs and ledges parallel the shore. Dolphins frolic in the waves and sometimes play with snorkelers. Caribbean tropical fish swim among the breaks and schools of gamefish hover just overhead. Near Panama City, wrecks can be found in relatively shallow water. Inland, the springs can be dived almost 365 days a year. And, between Hudson, Tampa/St. Petersburg and Venice, dozens of ship and airplane wrecks, as well as rock ledges, can be located. Some are inhabited by monster jewfish weighing 300 to 500 pounds!

Running out of the East Pass, between Fort Walton Beach and Destin, both natural and artificial reefs are found in depths of 60 feet or more. One of the most popular sites, owing to its closeness to shore, is the remains of an old concrete bridge that once connected the two cities. Called simply the **Bridge Rubble**, it consists of large cement chunks scattered in piles across a large span of sandy seafloor.

Hundreds of rock reefs are scattered from relatively shallow depths out to water substantially deeper than 100 feet. Most have similar appearances and rise only a few feet from the ocean's floor. Some, however, are quite high with reliefs of as much as six to eight feet. Many have two or even three names depending on which boat, or captain, takes you there. Some were named for their proximity to recognizable landmarks on shore, others for divers and charter operators. You may find yourself on spots called **Amberjack Rock**, **The Eighteens**, **Frangista**, **Red**, **Anna's**, **Gary's**, **White Hill** or **Timberholes**.

A rusting Navy LST, known as **Crash Boat Number Seven**, is sometimes dived. In more than 100 feet of water, it is cruised by a large school of barracuda.

In addition to shelling, two major activities attract divers to the Destin/Panama City Beach stretch of coastline: spearfishing and lobstering. Since the reefs and cover are so scattered and diverse, and the ocean shelf so large and flat, gamefish are found in extremely high concentrations. Unlike the coral reefs in the southern part of the state there is little likelihood that divers will ever make any substantial impact on the fish population.



Panama City Beach is best known for its wrecks, although reefs similar to those at Destin are often dived. Most, such as the wreck of the ***Grey Ghost***, were placed on the bottom as a part of a major artificial reef program. More than 105 feet long, the *Ghost* rests in just more than 100 feet of emerald gulf water.

Closer to shore, in 70 feet, the ***Chicasaw*** has only been down for a few years. She is a part of the artificial reef program and an open framework on her deck invites baitfish to make her their home. Lobster can sometimes be found hiding inside her hull.

The most exciting wreck in the Gulf of Mexico lies 21 miles out from Appalachicola near Cape San Blas shoals. A WW II tragedy, the ***Empire Mica*** was hit by two torpedoes from a German U-boat while on the return leg of her maiden voyage. Thirty-three men died by the glow of a full moon on the night of June 29, 1942. Resting in 100 feet of water, the bow of her 465 foot superstructure stands almost 60 feet above the sand.

Beginning in the Florida Panhandle, near Panama City, freshwater springs can be found close to the gulf almost all the way to Tampa. **Vortex** is a completely self-contained dive resort. With dormitory, camping facilities and a complete dive center, the spring is 200 feet in width at the surface.

Morrison is near the Choctawatchee River and is surrounded by cypress trees. One-half mile up a Spanish moss draped run from the river, the spring slopes to a cavern opening at 30 feet. Slightly deeper, at 50 feet, a second cavern is found.

Near High Springs, there is a private resort designed primarily for campers and divers. **Ginnie Springs** can keep a family entertained with hikes through the pine and cypress forest; tube float or canoe trips down the Santa Fe River; as well as snorkeling and diving. With a small general store and dive facilities, the resort has seven springs, three of which are open to divers. Of the three, Ginnie is the largest and has a large cavern room through which millions of gallons of water flow each hour. Brim, sunfish and bass swim about the basin of the spring, waiting to be fed hot dogs or bread. Not far away, **Devil's Eye** and **Devil's Ear** springs are actually one system with two openings to the surface.

A word of caution about all of the springs. Only certified cavern divers can go into any of these systems. Unless you are highly trained in this most specialized aspect of diving, entering a cavern or cave is dangerous and can be deadly.

A half hour away at Branford, a well equipped dive operation can direct you to any of several dozen superbly clear springs. In the middle of some of the finest spring diving in the state, this small town is a service center for the thousands

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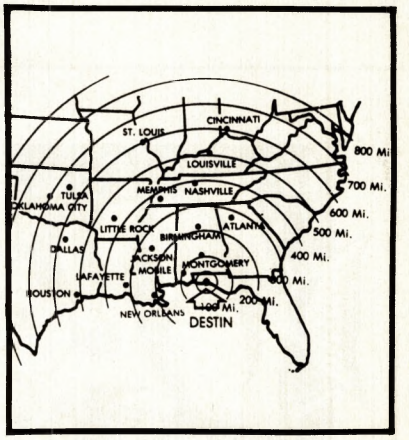
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AT THE FOOT OF THE DESTIN BRIDGE

of divers who drive to this area each year to dive and swim in **Little River**, the **Ichetucknee River**, **Royal**, **Yana**, **Blue Springs** or any of the others that flow into the Suwannee River.

The most popular of the Branford area springs, measured by the number of divers that can be found there on any weekend, is **Troy**. A large basin that flows into the Suwannee, it is wide enough and deep enough to allow the chance to dive deep (80 feet) in a safe environment. As it approaches the river, it shallows abruptly, carves a natural bridge in the overhanging stone and then flows past the ribs of an old Civil War river steamer.

The best known springs in Florida are those found concentrated near U.S. 19 at Crystal River. The West Indian manatee can be found here from November through April of each year. An endangered species, the manatees seek the abundant food and warmth of the year-round, 72°F water. They have little fear of divers or snorkelers and often swim directly into the middle of **King's Spring**, the most popular of Crystal River's dive spots, with a crowd of divers clamoring for a look or photo. However, do not attempt to chase or ride these animals. They are protected by state laws and the Florida Marine Patrol will hand you an expensive citation for harassing the animals.

In addition to King's there are five other springs closeby and dozens within an hour's drive. **Catfish Corner**, **Mullet**, **Grand Canyon**, **Manatee** and the **Rainbow River** are among the most popular.

On the Sun Coast near Hudson, the Gulf of Mexico has several unique sunken airplanes. A twin engine bomber lies in 30 feet, 14 miles out to sea. Its wings are still attached but the engines are separated and lie in the sand.

Another plane wreck, called the **Bomber Wing**, still has its wings, fuselage and all four engines relatively intact.

In addition to the airplanes, numerous ledges can be dived. Similar in appearance to those found along the Emerald Coast, some have substantial reliefs. **Giant Ledge** rises 12 feet from the sand.

Monster Rock is a popular place to search for lobster. Sixty feet deep, the ledge rises 14 to 16 feet from the sand.

Plateau Rock rises as much as 35 feet off the sand, with a maximum depth of 95 feet. It is almost circular and 30 to 50 pound jacks cruise it.

The wreck of a **Shrimp Boat** is found 30 miles out in 65 feet of water. Most of the rigging has been scavenged, making the wreck safe to enter.

Off Ft. Desoto, two wrecks can be found within a mile of each other. The **Sulfur Barge** lies upside down in 75 feet. Swarms of baitfish, hogfish and snapper surround its decks. Nearby, the ***Gunsmoke***, a wooden and steel shrimp boat, was sunk by its crew to avoid being captured while smuggling marijuana.

Thirty-seven miles west of Egmont Key lies the barge, ***Mexican Pride***. Three hundred feet long, it is upright at 125 feet.

The Coast Guard buoy tender ***Blackthorn*** is now 22 miles off Clearwater Pass. It was originally sunk in Tampa Bay when it collided by a freighter and more than 20 of its crewmen died. Refloated, it was towed to its present site and resunk.

Eighty to 100 miles out in the gulf are the **Middle Grounds**. A large open ocean reef, it begins in 50 feet and drops to 130 feet and deeper. Hordes of snappers, angelfish, butterflies and other fishes can be found on the rocks.

Near Bradenton and Venice the ledges continue. Many sites are found both near and well offshore. The most popular wreck in the area is that of the ***Bayronto***. Often called the London since its home port name was once inscribed across its stern, she is 30 miles out from Venice.

All along the coastline, more than 500 miles of it, and back to the springs, there is plenty of great Florida vacation fun for divers and their friends. You can swim, windsurf, snorkel, tan, sail, see the mermaids and a whole lot more. Florida's newest promotional slogan fits the Emerald and Sun Coasts just right. Whether you make it a weekend trip, or combine it with a tour of all the best diving in the state: "When you need it bad, we've got it good!"



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ONE OF A KIND

Cobra Custom Designs Your Dream Suit

TEXT AND PHOTOGRAPHY BY BONNIE J. CARDONE

If your idea of the perfect underwater garment is one in a dark, basic, absolutely dull color; one that resembles hundreds of others and would never make you stand out in a crowd, read no farther, Cobra is not for you! Not that the company couldn't make you such a suit, because they could. It would, however, be a waste of their talents.

A small, innovative company in Santa Monica, California, Cobra makes custom wetsuits only. You tell them how you want your dream suit to look and they'll produce it. A good looking example of Corbra craftmanship is the suit that illustrates this article. It is shiny red Lycra with a large white star on one leg. Two black panels, one around the waist and another that runs down the right side, provide dramatic accents. The model, my daughter Pam, called it her "Captain America" suit. It reminded me more of Wonder Woman! By any name, it is a stunning attention getter.

Since wetsuits have a very important function, you will be happy to know that Cobra suits not only look fantastic, they are well made, comfortable and will keep you warm.

Our Wonder Woman suit, for instance, designed for California diving, is one-quarter inch neoprene. Shiny Lycra is the outside material, the inside is nylon. This is a one piece jumpsuit and entry is through a heavy duty YKK nylon zipper down the front. There is a high collar for warmth. All edges are bound with matching sewn-on, stretchy seam tape. There is a diamond crotch for comfort, ease of movement and to eliminate seam stress.

Cobra suits are available in three thicknesses: one-eighth, three-sixteenths and one-quarter inch. There are three basic styles: a one piece suit such as the one that illustrates this article; a farmer john with jacket; or a high waisted pant with jacket. In addition to Lycra/nylon, the suits can be nylon one/skin inside, or nylon two.

You create your dream suit with the help of the Cobra staff. The company has body form patterns and offers a choice of more than 20 colors, ranging from hot pink to camouflage to navy blue. You decide what colors, thickness and style you want, then work with the staff to design a suit especially for you. Don't be shy, this is your chance to shine!

While you would expect custom suits to cost a bundle, this is really not the case with Cobra. The Wonder Woman suit you see here is $449. A one color Lycra suit might cost $329, while an especially creative suit utilizing several colors and an intricate pattern could run $600.

Have you always dreamed of having a wetsuit designed for you? You can make your fantasy come true by calling Cobra and setting up an appointment. For more information contact: Cobra Wetsuits, 3013 Ocean Park Boulevard, Santa Monica, CA 90405; (213) 452-6386.



Custom designed Cobra wetsuits are available in three thicknesses, several materials and three basic styles. Any of more than 20 colors can be worked into your personal pattern. The jumpsuit shown here had a shiny red Lycra exterior and nylon interior.

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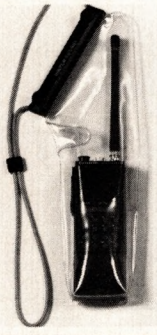


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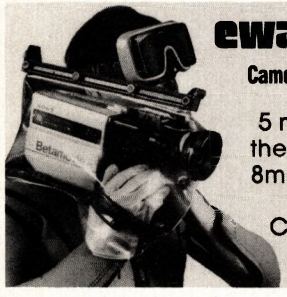
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DIVING MEDICINE

(Continued from Page 18)

moclines). Testing the surface water for comfort may be deceiving. A thermocline at 15 or 20 feet can cause an abrupt temperature drop for which you should be prepared. If you cross a thermocline, and get cold water in one ear, vertigo will result. The sensation of spinning can cause disorientation in the water. You can overcome the vertigo by watching your bubbles to determine which way is up. After both ears reach the same temperature (warm or cold) the vertigo will subside.

Hot water can also be a problem. Our skin temperature is usually 85-87°F. If the water is that warm, we cannot transfer heat from the skin and body temperature will rise. Doing hard work in 85°F water can result in heat exhaustion. If you are diving in warm water, minimize your exercise and do not use a wetsuit. This is one case where you want to lose heat.

SOLUBLE AND INSOLUBLE

Everyone has observed that certain materials dissolve in water, while others do not. A sugar cube will disappear quickly when dropped in water, but a glass marble will remain unchanged for years in the same water. Of course, we take advantage of this difference in solubility in many of our everyday activities. Water has a unique structure, which allows certain substances to "fit" between the water molecules. These substances are more or less matched to the shape of water molecules and are, therefore, soluble. Alcohol is a liquid that fits into water and so it is soluble. Such liquids as oils and benzene do not fit between the water molecules, so they do not dissolve. Instead they either float or sink depending on whether they are heavier or lighter than water.

Many toxic substances are soluble in water. If we dive in contaminated water, these substances can enter the body directly through the skin. Many of them can pass through dry or wetsuits to make contact. Toxic exposure to soluble chemicals in water can be a serious hazard to divers. Fortunately, most sport diving is done in relatively clean water. If you must dive in water suspected of chemical contamination, find out what is in the water before you dive and its potential toxicity. One example known to salvage divers is hydrogen sulfide, a product of rotting foods in sunken ships. Hydrogen sulfide is soluble in water and can penetrate rubber. It is highly toxic and, if present, will pass through suits and hoses and may incapacitate a diver before he can get out of the water.

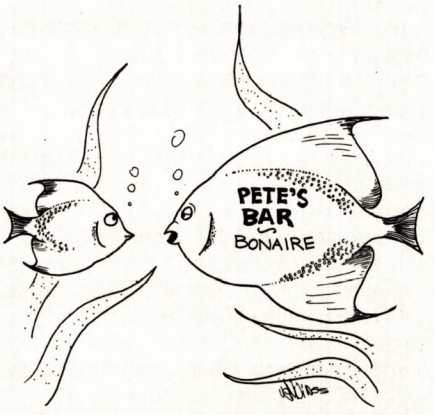
Nonsoluble substances pose another hazard. I once consulted on a problem of underwater explosion during attempts to salvage a sunken tanker. Divers working under one part of the ship were striking an arc for their cutting torches in a pocket of pure gasoline! Here again, if contaminants are suspected, a survey of the diving area should be carefully performed. In some cases samples must be taken to be sure there are no pockets of insoluble or toxic liquids that can injure divers. The best advice is to stay away from water suspected of contamination. Diving of this type is highly specialized and may require special diving dress and complex decontamination procedures.

SOME MECHANICAL CONCERNS

Most water moves readily. The exceptions are when it is frozen and when it must move very rapidly. Because water is viscous, it offers resistance to motion, which depends on the speed of water flow (or diver motion). At very high speeds, water acts more like a solid. You can experience some of the solidity of water if you do a "belly flop" from a platform or if you decide to do an entry from a high dock, deck or other structure. If you hit the water on entry at a rapid speed, you will find much of your equipment having difficulty following you beneath the surface. Your tank may wish to remain behind, your regulator may leave your mouth with or without a few teeth and other items (mask, knife, camera) may be swept away. Respect for water's resistance to motion is an important aspect of diving.

Respect for water in motion is yet another aspect of good diving. Most waves breaking on a beach weigh many tons and move quite rapidly. It is futile for a diver to plunge headlong into an advancing wave. You may return from the encounter with most of your equipment gone, or worse, the equipment may return without the diver.

Water—we are almost two-thirds made of it. Without it, we would have no diving and, more important, we could not live. At the same time, it offers many hazards, some obvious, some imperceptible. Drink it, swim and dive in it, sail on it, keep it clean. And, as divers, respect it for its hazards.



"They were giving away free tattoos ...so I got in line!"

SDM travel SECTION





THE SUDAN

Adventure in The Southern Red Sea

TEXT AND PHOTOGRAPHY BY CARL ROESSLER



For those of you who have enjoyed (or dreamed about) diving in the Red Sea, I have great news. See & Sea Travel of San Francisco is now offering an all new Red Sea diving adventure in an undiscovered hideaway—the Sudan.

For me, this was a mystical journey back to my youth. In 1952, Jacques Cousteau's early film, *World Without Sun*, appeared in movie theaters. I watched, enthralled, as Cousteau's team lived in a fabulous undersea habitat called Starfish House. This astonishing habitat, complete with the first shark cage (in 75 feet of water) and the Sea Flea (a small wet sub) was the stuff of my young dreams. Yet, as I studied engineering and management at Yale, the very idea of an undersea habitat off Port Sudan was a magical fantasy. Did people actually do such things? Was a life of undersea adventure actually possible? I went back to my studies after that day in the theater with a rumble of discontent, a vague shadow in my mind that designing widgets was not how I wanted to spend my life.

Thirty-three years later I stepped off a plane in sleepy Port Sudan. In this quiet port city I discovered the gateway to my own young dreams began but an hour away.

I'm delighted to say that you can now share this dreamstuff with me. Not only can we dive the living remains of Starfish House; there are also two major wrecks, fabulous reefs and all the shark feedings you've ever wanted. Sound interesting? I thought it would.

Our adventure begins with a two hour flight due south out of Cairo, following the shoreline of the Red Sea. From the air, the contrast between the desert sand and the deep blue water sets up a pleasant conflict in your mind: Somehow the sea seems more romantic when it is surrounded by this dry cauldron of endless desert.

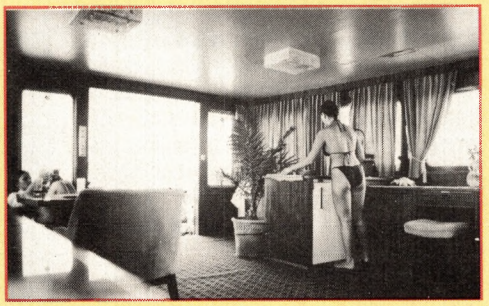
When we step off the plane, we are whisked through the formalities and find ourselves rumbling through towns in a bus. Port Sudan is quiet and modest, the businesslike seaport and commercial center for this vast East African country. At the harbor, amid a jungle of freighters and loading docks, our dive boat *White Elephant* sits at anchor. This 110 foot steel ship boasts an elegant saloon, air-conditioning, good food and easy access to diving. Large and stable, *White Elephant* has a whiff of cruise ship about her as she steams. There is a feeling of being visiting royalty as you lounge on the upper deck and watch the ocean slip by far below. Indeed, you ache with eagerness to slip into that crystal blue sea. The ship's unexpected amenities in this far-off paradise are welcome, because we are going to dive up a storm. I've come to recapture 30 years of my life in the process.

As *White Elephant* raises anchor, we quickly assemble our dive gear, for the first dive site is but an hour away. We pause for a moment to take in the panorama of the busy tropical seaport, then watch it all diminish to a dusty line on the blue horizon.

Not long after, we are pulling up to our first dive spot. And, what a site! It's another legend—the fabulous wreck of the *Umbria*. At the outbreak of World War II this Italian ship was ordered to surrender. While the English commander was aboard to complete the surrender negotiations, the Italian captain distracted him with a fine dinner

travel





The 110 foot *White Elephant* is stable, air-conditioned and features a spacious saloon. The vessel makes ten day cruises out of Port Sudan to the wreck of the *Umbria*, a shark feeding arena and the remnants of a Cousteau underwater habitat.

while the crew opened the seacocks. Talk about destroying the ship in order to save it!

For us, though, the gesture was an historic act. The *Umbria* lies on her port side with her cargo boom actually breaking the surface. She swarms with fish and offers a hundred photo angles, each of which is a triumph of design. Most welcome of all, the water temperature here is near 85°F.

From the *Umbria*, we steam northward to Sha'ab Rumi and my first rendezvous with 1952. *White Elephant* approaches the small atoll, steams through its one small entry pass and drops anchor in a placid bit of heaven. From the upper deck we look south and observe a school of dolphin that uses the lagoon as home. There are nearly 200, lolling gently just beneath the surface with 20 gleaming dorsals at a time rising to the surface for air. We race over in our inflatable and slip into the water, but the wary dolphins keep just out of camera range, rolling their eyes at us as they whiz by.

That evening, after a delicious dinner, we settle down for a night's sleep with visions of Cousteau and company flickering through our thoughts. Will it all come true as we dream it?

The morning dawns and, after an early breakfast, we are once again on our way. Slipping into the warm, clear water outside the lagoon entrance, Jessica and I are confronted with a true vision out of all those long-ago fantasies—like some exotic UFO, the onion-shaped garage for the Sea Flea wet sub gleams in crystal-clear shallow water.

Staring at the futuristic structure on its three thin legs, I am consumed with admiration for Cousteau's design flair. He had obviously seen some of the early outer space films, for this structure would look just as perfect on a Hollywood moon.

After photographing the structure from every conceivable angle, we enter through the underside and find ourselves looking out through the portholes. The small dome-shaped room has a huge bubble of expelled divers' air inside, just above the portholes. The imagining is vivid and easy: The years fall away.

After the Flea hangar, we explore further. Several small greenhouse structures are where Cousteau stored small fish under glass to watch the hunting behavior of big fish.

As a finale, we soar out over the drop-off and down to the shark cage, now solidly overgrown with coral. The cage swarms with anchovies, who use this shelter to avoid being eaten for just a little longer.

After we have dived our fill of the Cousteau site, we explore the south point of Sha'ab Rumi. Here we find a natural shark-feeding arena. Throughout the years I've done a lot of shark feedings, but this is something new. At 60 feet, we set our baits and discover that the sharks here are civil servants—not too aggressive, slow enough to be easily photographed and practically saying "please" and "thank you."

We are so thrilled with the opportunity to collect shark portraits that we begin doing feedings twice a day. Compared to our Coral Sea/Australia adventures, where the sharks are like runaway rockets, these feedings are a productive pleasure.

To illustrate how polite these sharks are, on one feeding my companion ties a small fish carcass on a wire coral when I'm looking the other way. As I film the sharks, I find these wire corals are getting in my way; I tuck them under my arm so they won't get in my pictures. Next thing I know the sharks are nuzzling me from all sides. I wonder why I am suddenly so irresistible. As I push the sharks away, the wire coral slips out from under my arm and the fish carcass ends up under my nose with three sharks racing in to grab it. My world is full of shark eyeballs and teeth—then with a wrench the wire coral tears loose and sharks, carcass and coral zoom off.

Four kinds of diving make this Southern Red Sea diving irresistible.

First, there are the great wrecks. Not only the spectacular *Umbria*, but also a thoughtfully placed modern transport filled with Toyota automobiles. For the wreck fan, Sudan diving is star-class.

Second is the Cousteau habitat, one of the world's best diver's toys.

Third is the shark-feeding, for those who enjoy it, with polite sharks.

That leaves the reef diving, but let me assure you it is not the least. This is Red Sea diving at its best, on a par with the great Sinai reefs such as Ras Muhammed or Jackson Reef. There are massive coral heads literally covered with soft corals; there are stupendous drop-offs cleft with steep gorges; there are huge schools of barracuda and jacks; there are gardens of intri-

(Continued on Page 106)

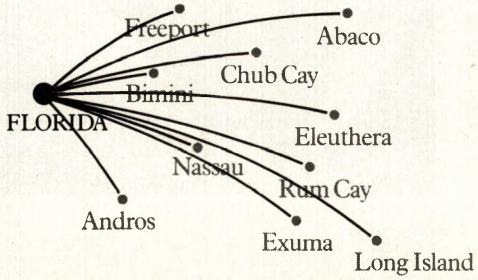
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TEXT AND PHOTOGRAPHY BY STEVE LUCAS

The bottom slips away quickly, directly off the beach. Like the slope of an aquatic mountain, decorated by an artist obsessed with fanatical colors, it descends from an almost perpetually calm surface. Not a plummet, but a steady drop, it obliquely fades into the deep.

Orchestras of trumpet-like purple sponges pipe their silent, but inviting song to divers and snorkelers suspended above. Fluorescent orange sponges—elephant ears—are almost as large as the bodies of their namesakes. They hang in clusters from the underwater cliff. Corals grow in a tight fusion. Looking like Alice's Wonderland, the seascape is so surreal, so dream-like, it wouldn't be a surprise if the March Hare, the Red Queen or the White Queen paraded by at any moment. It's like no other place in western tropical oceans: It's Bonaire.

A small, arid, Netherlands Antilles island with a tiny sister called Klein Bonaire floating in its crook, Bonaire lies 50 miles north of Venezuela. Its landscape and seascape vary greatly from tip to tip. The northern arm runs east and west; the southern, north and south. In the northwest, the terrain is hilly, at places almost mountainous, and is a preserve known as the Washington/Slagbaai National Park. Flamingos walk on stilt-like legs through the salt beds of Lake Goto Meer. Lizards scurry across the narrow roads. Except for the village of Rincon, this part of the island has few inhabitants.

To the south, past the main town of Kralendijk, Arizona-like cacti grow from a bed of coral rock. Salt is commercially reclaimed from the sea and piled high in snowy white mounds. More flamingos nest in the adjacent ponds, parakeets fly across the desert scene and wild donkeys graze among the cactus.

The wind blows steadily from the east and the windward side of the island is constantly pounded by a roughened sea. The land blocks the ocean's march on the leeward side, making waves of more than a few inches uncommon. Years of exposure to wind and water have cut deeply into the terrain. The entirety of the leeward coastline consists of little more than jagged, coral ironshore rock. Almost all of it that is, except for a wide, powdered-milk beach called Playa Leche.

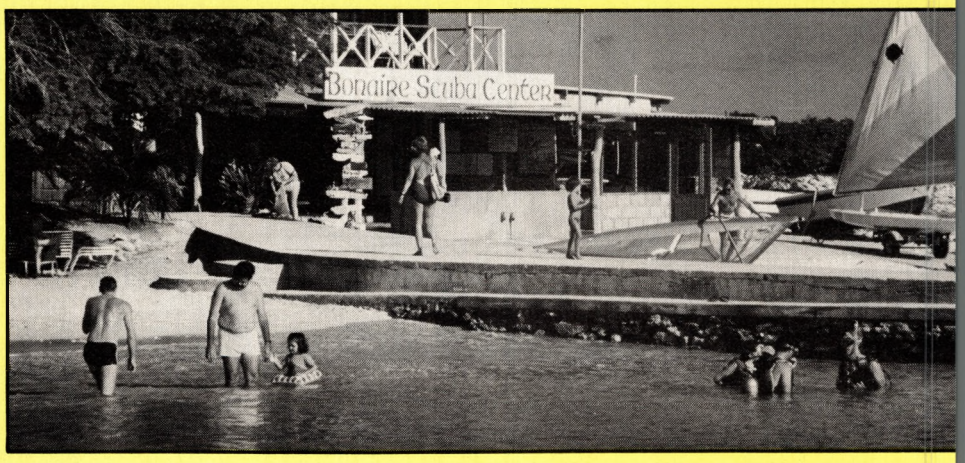
Built directly behind this, the only major beach on Bonaire, is one of the island's favorite dive hotels. Undergoing a complete renovation and spread across newly landscaped grounds, the Bonaire Beach Hotel and its Bonaire Scuba Center offer plenty of personal space. There are a number of areas to keep you as active, or inactive, as you may prefer.

With two restaurants, the indoor Neptune and the waterfront Beach Hut Restaurant and the Black Coral Casino, each evening's entertainment is casual and pleasant. Buffets are set several times each week and live entertainment is scheduled on at least one night during a week's stay. On Wednesday and Sunday evenings the casino tempts you to try your luck by giving away $10 in free chips to anyone dining in the Neptune.

The resort is perfect for families and small children or for divers with non-diving companions. There is a boutique in the main lobby and a miniature golf course between the large, thatched roof Beach Hut restaurant/bar and main hotel property. South of the hut, behind the dive facility, several lighted tennis courts are available. Sailboarding and Sunfish sailing are popular. An all-island Sunfish regatta is held each Sunday. If you like sailing, but want someone else to handle the rigging, board the sailboat *Lady Joma* in the early evening and watch the sun turn the ocean 100 shades of red and orange as it slips out of sight.

Owned by Al Catalfumo and Bonarian Eddie Statia, the Bonaire Scuba Center operates a relaxed, unregimented dive operation with flattop boats leaving the dock each morning and evening. Eddie is operations manager and Al, based in New Jersey, is director of marketing.

With a creed of personal attention and an affinity for small groups, the dive guides frequently go in the water with you to point out the special places and ani-





Above: The Bonaire Scuba Center, Beach Hut restaurant, pier and Playa Leche Beach. Right: Divers enjoy Ebo's Special.







Above: Miniature golf at the Bonaire Beach Hotel. Top: Water level view of Playa Leche Beach. Right: Lunch at the Beach Hut restaurant. Photo lab. Below: Divers with sponge at Forest.

mals that have made Bonaire famous.

Underwater photography plays a major role at the center. Professional instruction is available, so experience is not a prerequisite. You can rent almost any piece of photo equipment, from simple Hanimex cameras to sophisticated Nikonos 15mm lenses. Ektachrome, Fujichrome and other E-6 type films are processed daily in a modern lab.

When not diving on Ebo's Special (named for Ebo Domacasse, one of the island's oldest and best known divemasters), Carl's Hill or one of a dozen other top sites on Klein Bonaire via the flattop boats, beach access is easy right in front of the hotel. Front Porch reef drops to a depth of more than 90 feet just off the dock. At 70 feet, an old boat lies on its side, sporting its decoration of sponges and corals. To the north of the pier, the growth is quite dense, to the south, it tends to be a bit more sparse.

(Continued on Page 112)

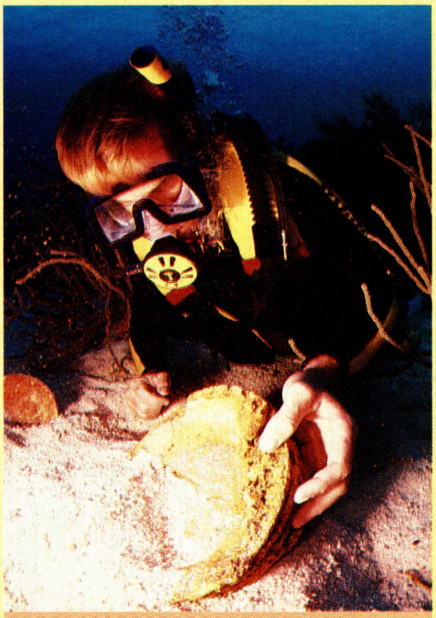




Neal Watson's



BIMINI
UNDERSEA ADVENTURE





Clockwise from top: Neal Watson, owner/operator of Bimini Undersea Adventures, and Tulla Cove explore strange formations at Bimini Atlantis. An aerial view of Bimini with the Big Game Club in the foreground. Neal and Tulla on beach. Bill Keefe, co-manager of Bimini Undersea Adventures, finds old plates.

TEXT AND PHOTOGRAPHY BY RICK FREHSEE

Perhaps it was luck; perhaps it was the time of year. Perhaps it was just Bimini. This, my most recent visit, was a kaleidoscope of activity. After a supercharged 130 foot wall/drift dive, we photographed purple and emerald seafans in the shallows off North Turtle Rocks. Then we encountered schools of Atlantic spadefish, Bermuda chub, jack crevalle, striped grunts, yellow goatfish and a huge moray eel. Along the way we came across a couple of 15 pound hog snapper, a ten foot nurse shark covered with remoras, a bevy of spiny lobster and head-on confrontations with several spotted eagle rays. On the way back to North Bimini channel, we topped off the day by freediving with a school of wild dolphin. My dive buddy, Adam Ravetch, the 1985 Our World—Underwater scholarship winner, could hardly believe his eyes.

I wasn't surprised. My earlier adventures in Bimini are practically a matter of public record; my first magazine articles from the early 1970s featured night dives and giant jewfish here. My first assignment for National Geographic (Search for Atlantis) and my first feature story for same (March of the Spiny Lobster) were photographed in Bimini waters. In the

mid-1970s, I dove with the Cousteau/*Calypso* team in a blue hole cave and filmed the migration of spiny lobster for national television. In recent years, I have shot two dive catalogue assignments here as well as the latest Bahamas travel poster.

A series of adventure ads featured Neal Watson, a living legend of Bimini waters (world's record deep diver, distance diver, gyrocopter distance record; source: *Guiness Book of World Records*, who started Bimini Undersea Adventures nearly ten years ago. Neal now owns and manages three operations in the Bahamas. Neal and Bimini diving are synonymous—one could not have developed without the other. He has wrestled sharks, explored wrecks and dived the Bimini Wall often for my cameras. From this a special friendship has developed and the result has been a series of visits to an island I once lived on for several months while shooting for Geographic.

Objectively, North Bimini is a skinny little island barely one-quarter mile wide by seven miles long. Occasionally, honeymooners deplane a Chalk's Grumman Mallard here with startled expressions: They'd anticipated a Nassau or a Freeport. Downtown (Alicetown) is a single street (King's Highway) with a handful of bars, shops, offices and a couple of low-key restaurants and hotels. But my opinions of Bimini are definitely subjective. Bimini has soul. It is a three mile strip of parties, good times and outrageous carrying on unmatched on any other family island in the Bahamas. It is, after all, a place of legends. Nearly one-third of all the world's record gamefish were caught here; Hemingway lived, fished and wrote here; presidents, diplomats, movie stars, smugglers, fishermen, divers and honeymooners play here. Bimini is like Tijuana, Cabo San Lucas or Key West—you go because it's there. Bimini is Brown's Hotel, the Compleat Angler, Bimini bread and some of the best diving this side of the Gulf Stream.

The reefs close to the Biminis are good and varied. (The Victory Reefs are absolutely great.) The highlights of Bimini diving are the visibility and the marine life. Both are direct results of the Gulf Stream and its cleansing effect on this side of the Bahamas. The wind can blow—and sometimes it does in winter—but with one tidal change the visibility can be back to 100 plus feet. This was the secret that allowed me to film the lobster march just a mile away from the channel. The marine life is remarkable; there is more diving adventure per mile than almost any other place in the Bahamas/Caribbean.

Start with the *Sapona*. Objectively, it is the wreck of an old cement ship in shallow (20 feet) water. Subjectively, it is rum-running, hurricanes and the target of the famous Avenger Fighter Squadron, lost forever in the Bermuda Triangle. Inside the wreck the light plays soft.

Moray Alley is a large area of popcorn-shaped coral heads where I shot the most recent Bahamas travel poster with model, Tulla Cove. The 60-70 foot depths include a variety of corals, sponges and schooling fish. Huge hog snapper, big green morays and giant Atlantic stingrays are often easy to find. Visibility averages 80 feet and is sometimes 150. Nearby, Hawksbill Reef and the Kinks have similar features.

Turtle Rocks is a smorgasbord of diving with something for everyone. There are a half-dozen different sites within a short distance of the rocks with large solitary head corals and long-running ledges often packed with spiny lobster.

The Pickett Rocks are good areas for schooling fish—mostly grunts, goatfish and snapper—all in 35 feet of water.

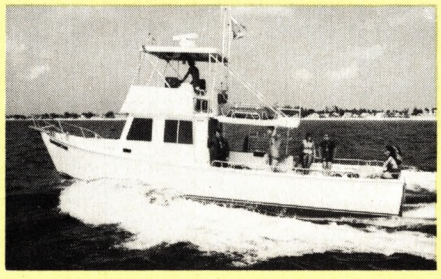
The two most exciting dive areas in Bimini's repertoire are the Victorys and the Bimini Wall. Neal Watson has choreographed one of the most memorable deep diving experiences in the Bahamas with a drift dive along the Bimini Wall. It is so well-engineered by his staff it is possible to include intermediate as well as advanced divers. The visibility is usually 100-150 and occasionally approaches 200 feet. Often at 140 feet, you can look up and see other divers, the line and float and the dive boat in dramatic silhouette. The drop-off begins at about 120 feet and a lush landscape of deep soft corals, black corals and colorful tube and encrusting sponges pass by in an expected two to three knot current. In a ten minute bottom time it is not unusual to count more than one dozen 25 pound plus Nassau groupers. Often schools of amberjack, mackerel and dolphin are sighted. You may even catch a rare glimpse of tuna or a shark.

Once a week, weather permitting, a day trip is scheduled to the Victory Cays. With lunch on board, the hour trip will take you to one of the best dive sites in the Bahamas. The sloped bottom runs from 35 to 80 foot depths over a heavy spur and groove system. The reefs are massive with ledges, caves, tunnels and overhangs to seaward. This is by far the prettiest area of coral growth and the visibility, often 150 feet plus, is spectacular.

Bill Keefe and Nowdla Stevenson are the co-managers of Bimini Undersea Adventures. Bill is a former divemaster at UNEXSO in Freeport and Nowdla is a resident Bahamian. This handsome couple has appeared as models for several advertising shots and, more importantly, are personable hosts and excellent divemasters. They made my recent stays in Bimini a pleasure.

Undersea Adventures' *Sharkbuster*, a 40 foot fiberglass diesel custom boat, is a handsome showpiece and a no-nonsense divers' craft. Features include deck space and storage area, a rugged dive platform/ladder system, step-through transom and side tank racks.

There are packages available with two hotels, Brown's (the location of Bimini Undersea Adventures) and the Big Game Fishing Club. Brown's has decent rooms with air-conditioning and hot showers, but is strictly no-frills. The restaurant serves decent meals in good-sized portions. If you wish a truly first-class stay at a fair price, the Big Game Fishing Club is highly recommended. It is one of the nicest hotels for divers and fishermen in all of the Bahamas and is another of Bimini's legends. Owned by Bacardi International, the ambience and decor are excellent and the food is quite a treat. The manager of the club is Michael Kaboth, the current president of the Bahamas Hotel Association. The deluxe rooms, gourmet meals, tennis courts, pool and patio bar are appreciated after a day of diving.



The 40 foot *Sharkbuster*



A Chalk's seaplane in N. Bimini channel.

One final legend is necessary. The most spectacular way to come to Bimini is the obvious—by Chalk's International Seaplane Service. It leaves Ft. Lauderdale and Miami for Bimini daily. You leave the Florida mainland in a flying legend, the Grumman Goose, which lands in Bimini Harbor 20 minutes later. After immigration and customs, you're a minute away from Bimini Undersea Adventures.

Three dives a day and coming and going any day of the week is possible for Bimini divers. It's the foreign country with wilderness diving that is only 60 miles away from the Florida mainland.

For packages and information contact: Bimini Undersea Adventures, P.O. Box 21766, Ft. Lauderdale, FL 33335; (305) 763-2188, (outside Florida) (800) 327-8150.





The Cayman Islander

A Great Dive Package At A Bargain Price

TEXT AND PHOTOGRAPHY BY GERI MURPHY

Going to Cayman but don't know where to stay? Thousands of divers face this dilemma each year, for Grand Cayman offers a mind boggling array of hotel, condo and guest house combinations. Choosing the right one can affect how much you enjoy your vacation or whether you can afford to go in the first place.

The Cayman Islander is a great choice for divers who really don't care about beach facilities, but want good diving at affordable prices. This small, unobtrusive resort is set back from the beach and, therefore, has lower room rates. In fact, it is the best priced hotel in the Seven Mile Beach area, yet it is still right in the middle of all the fun. Best of all, you get the same quality diving you would at a big time beach hotel.

HOTEL

The Cayman Islander is a clean, modern motel-style facility, which would be similar to any high quality motel found in the U.S. It is a mid-sized facility consisting of 68 rooms, mostly at ground level.

The Islander is right on Seven Mile Beach's main drag, West Bay Road. It is



The Cayman Islander is a modern motel-style facility with 68 rooms and an exceptionally friendly staff. Seven Mile Beach is just a few hundred yards away. The hotel grounds are spacious and surround a freshwater pool. Bob Soto's fleet of boats carries guests to more than 30 top dive sites—all within 20 minutes of the hotel. These include such famous locations as Trinity Caves (right).



centrally located, just two miles from George Town, five miles from the airport and one mile from the Holiday Inn. The beach is across the street, just a few hundred yards from the hotel's front door.

Every Islander room features full air conditioning, two double sized beds and a private bath. All rooms now have satellite TV and telephone service is available in the hotel lobby.

The hotel grounds are spacious, well landscaped and there is a freshwater pool in the center. There is more than ample parking, and much to the delight of gear lugging divers, you can get a car almost next to the hotel room door. The hotel staff is exceptionally friendly and manager Jim Casselden is an ex-British commando from WW II days.

give these spots enthusiastic ratings.

DIVING SERVICES

Diving services for the Islander are operated by Bob Soto's Diving Limited, the longest established and best known in Grand Cayman. Soto started this business almost 30 years ago and it is still going strong under the leadership of Ron Kipp.

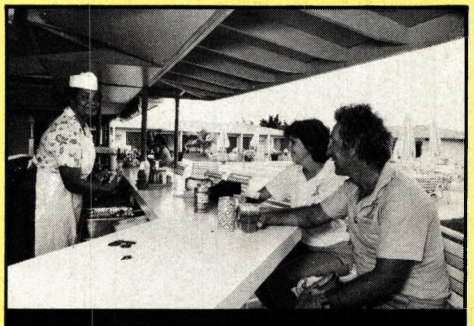
Soto's is a major diving company with a fleet of seven dive boats, tons of tanks and dozens of divemasters. They conduct morning and afternoon dives daily and night dives twice weekly.

Soto's provides free pick up and return for Cayman Islander guests, using a customized truck called Soto's Shuttle. Pick up time for the morning dive is 8:30 am

early morning descent are spots such as Orange Canyon and Round Rock. These are sheer walls with a breathtaking array of gorgonian fans. Big Dipper is the site of a gigantic basket sponge, while Trinity Caves is a winding coral canyon with sponges and a magnificent black coral tree. There is an awesome ten foot tall barrel sponge at Sand Chute and a marvelous archway at Big Tunnel. Underwater visibility at these sites can range from 150 to 200 feet depending on the day and the currents.

After a surface interval, the dive boat moves to the second morning location, which can prove to be just as fascinating. Spanish Anchor is a lovely reef filled with living corals and small sponges. Aquarium is great for angelfish and other tame





All Islander rooms feature air conditioning, two double size beds and a private bath. One of the favorite gathering points is the open air restaurant/bar, where breakfast, lunch and light dinners are served. It opens at 7:00 am, ideal for divers with an early morning pick up.

DINING

One of the social gathering points at the Islander is the open air poolside restaurant/bar. This facility serves breakfast, lunch and casual, light dinners. The restaurant opens at 7:00 am, which is ideal for divers who have an early morning dive pick up. It serves a wholesome breakfast, including great omelettes. You cannot beat the Islander for lunch either, as it offers the best hamburger on the island. The bar is open for Happy Hour from 5:00 to 7:00 pm daily, offering two drinks at a dollar each.

As for dining out, some of Grand Cayman's best restaurants are within a one mile radius of the Islander. If you are in the mood for a dress up evening and gourmet dining you might try Le Diplomat, Chez Jacques, Caribbean Club or L'escargot. These are all top notch restaurants less than a three minute cab ride from your doorstep.

On the other hand, if you are seeking a more casual dinner with good food, you might try one of the several in-spots for divers such as DJ's, Edoardos Trattoria, Lobster Pot, Davey's Seafood or the Lone Star Bar & Grill. The divemasters

and guests return to the hotel between 12:30 and 1:00 pm. Guests are transported to the Holiday Inn beach, Soto's center for all dive trip departures. The ride takes less than three minutes. Morning trips are two tank dives at two different locations. The first is a deep wall dive and the second is a coral reef dive in shallow to medium depth water.

Cayman Islander pick up for the afternoon dive is 1:30 pm and guests return to the hotel at approximately 4:30 pm. While afternoon boat trips are not part of the Cayman Islander dive package, they are available as an optional add-on. Night dive departures depend on the time of sunset during various seasons of the year.

DIVE SITES

Since Seven Mile Beach is central to the majority of Grand Cayman's diving, guests staying at the Islander have access to some of the most beautiful and exciting reefs you would find anywhere in the Caribbean. More than 30 top dive sites are within a 20 minute boat ride from the Holiday Inn beach.

The most popular wall dives for the

tropicals. Three Tree Reef and Hammerhead Hole are two more delightful spots. And, last but not least is the famous *Oro Verde* wreck, a 180 foot steel freighter still intact and lying in 50 feet of water. It is a marvelous spot for U/W photography, fish feeding and wreck exploration.

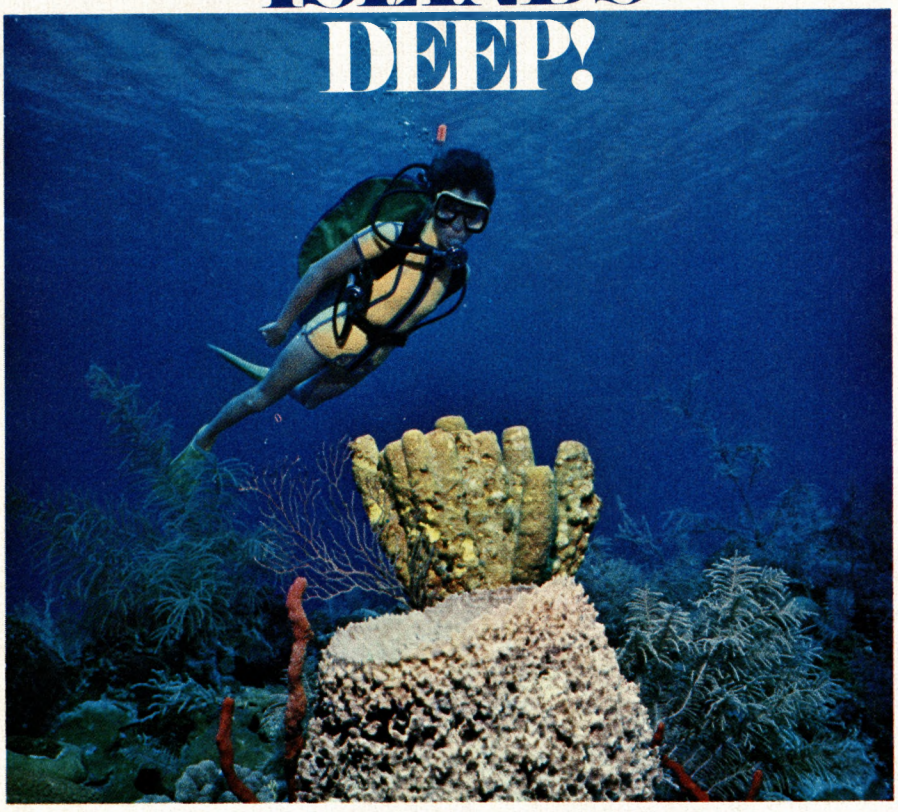
Afternoon dives are scheduled for a completely different selection of reef sites. Most are in 40 to 60 feet of water. Soto's Reef South is great for marine life observation while Devil's Grotto is a labyrinth of coral tunnels and caves. The *Balboa* wreck is a favorite spot for macro photography while other shallow coral reefs include Soto's Reef North, Eden Rock and Hamburger Reef.

Night dives are scheduled twice weekly—to the *Balboa* on Tuesdays and the *Oro Verde* on Saturdays. Both sites are a carnival of fish life and exotic reef creatures that seem only to appear during nocturnal hours.

DIVE PACKAGES

The Cayman Islander, together with Bob Soto's Diving Ltd., has come up with a special dive program known as the Bonus Dive Package. The prices are ex-

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CAYMAN ISLANDER

traordinarily low, making it one of best bargains in the Caribbean. The program is exceptionally flexible.

A diver staying at the Cayman Islander can purchase the package in two, four and six night lengths. The program is priced for single, double, triple or quadruple room occupancy. When compared to similar programs at beachfront hotels such as the Holiday Inn, a diver can save up to $200 on a full week package: This amounts to approximately 28 percent.

The Bonus Dive Package includes an impressive number of features including: transportation from and to the airport; a welcome cocktail drink; a room with satellite TV; full breakfast daily, maid service daily, a morning two tank dive daily; one night dive or afternoon dive by boat; free admission to the Cayman Islander Night Club; and unlimited shore diving.

The unlimited afternoon shore diving can be a big plus for those who want to cram in as many dives as possible. Islander guests can pick up their tanks, backpacks, dive flags and weightbelts at Bob Soto's Scuba Centre. Each person is limited to one tank, but you can obtain all the air fills you want. Shore diving can be done directly off the Scuba Centre or at a half-dozen sites around the island. This is where having a rental car really pays off.

To make matters more exciting, the Cayman Islander has now incorporated a roundtrip airline ticket into the package. For example, you can buy a Bonus Dive Package for three nights (two days of diving) and roundtrip air fare from Miami for as little as $399. The cost from Tampa or Houston is a few dollars more.

For more information about the Cayman Islander or the variety of bonus dive packages you can write to: Cayman Islander, 5920 Rodman Street, Hollywood, FL 33023. Telephone: U.S. toll free (800) 327-3835 or Florida toll free (800) 233-8880. If the toll free number is busy you can call (305) 987-8880.

ST. JAMES CLUB

The St. James Club, St. John's, Antigua, offers 95 bedrooms, suites and lagoon-side villas, each with air-conditioning, telephone, radio and 24 hour room service. The resort features a freshwater swimming pool and gymnasium, horseback riding, glassbottom boat rides, deepsea fishing, tennis and other activities. The Aquanaut Diving Centre offers certification courses, organized dives and rental scuba gear.

For more information contact: St. James Club, P.O. Box 63, St. John's, Antigua, West Indies; (809) 463-1430 or 463-1113.

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DUTCH SPRINGS



TEXT AND PHOTOGRAPHY BY ROD CANHAM

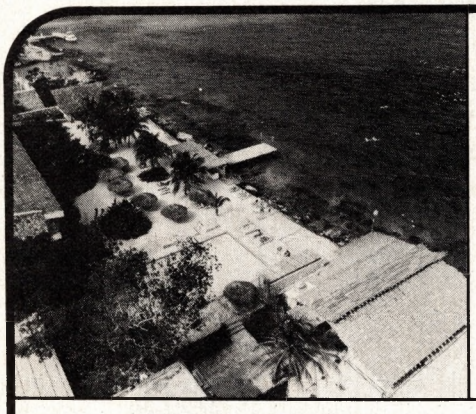
Dutch Springs has recently been added to the list of quarries that have become freshwater draws for northeast sport divers. Its nearly 50 acres of unusually clear waters, interesting underwater attractions and the owner's commitment to promoting safe, enjoyable diving, have rapidly propelled the quarry into one of the area's leading diving attractions.

Pennsylvania has long been known for its previously mined stone quarries that have inadvertently filled with spring water and become popular dive sites. The emergence of Dutch Springs on the scene has been enthusiastically received by the local sport diving community.

Formerly mined for limestone by the now bankrupt National Portland Cement Company, the quarry's water seems relatively free of suspended silt. Its 25 to 55 plus feet of lateral visibility is unusual among northeast dive sites. This allows divers and students to fully enjoy the underwater features. As with many flooded quarries, abandoned equipment remains a silent testimony to its previous mining operations. Foundational structures rise to the surface from 80 feet, a tanker car rests at 75 feet and a stone-slurry silo stands in 20 feet of water at the quarry's edge. A network of large underwater pipes and related pumping stations attest to the company's unsuccessful efforts to keep the mining operation free of incoming spring water.

Several other attractions not related to diving have been placed about the bottom of the quarry by the owners since its opening on Labor Day in 1980. Several cabin cruisers were obtained from Barnegat Light, New Jersey, gutted for safety, and sunk along with other smaller boats and automobiles. Dutch Springs' most unique attraction is the shell of a single engine Cessna that lies on its belly in a basin 25 feet deep and may be seen from the surface by snorkelers.

The quarry's development has been carefully directed by managing partner Stuart Schooley. A certified public accountant, Stu learned to dive in 1980 and has worked hand-in-hand with local instructors in developing the attractions at Dutch Springs. His commitment to safe and fun diving is reflected in the underwater training area and circuit. Four submerged platforms lie approximately 50 feet offshore. Suspended from the bottom at 30 feet, they allow students silt-



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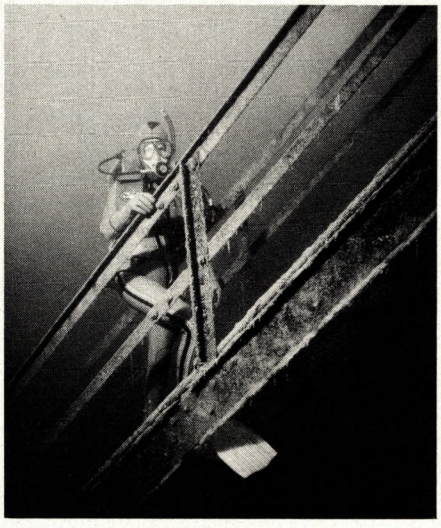
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free orientation and an easy introduction to their new environment. The circuit begins at the platforms and is connected by heavy lines that direct divers to the cabin cruisers and tanker car. The circuit culminates with a stop at the airplane before completing the loop back to the platforms. All the major sites are tied together and marked with surface buoys for easy relocation. With depths ranging from 25



to 75 feet, the entire course can easily be completed on a single tank of air.

Dutch Springs has compressed air available at the gate provided by a 3,800 psi, 15 cfm compressor and a 12 bottle cascade system. It's also within a short driving distance of two full service Five Star PADI training facilities. Its pristine support facilities include two trailers (used as changing rooms), portable toilets and a large picnic area. To date, the quarry is only open for snorkeling and



scuba diving. No fishing, swimming or camping is allowed. Eventual expansion plans include the development of camping facilities, a swimming area, paddleboat and canoe rentals and the building of two pavilions. But progress is being hindered by restrictions from the Department of Environmental Resources. Their requirements for running water and sanitation facilities would necessitate a large capital outlay not yet generated by the quarry's seasonal business. The fact that Dutch Springs is unknown is paradoxically its greatest liability as well as its greatest asset. The funds needed for develop-

(Continued on Page 104)



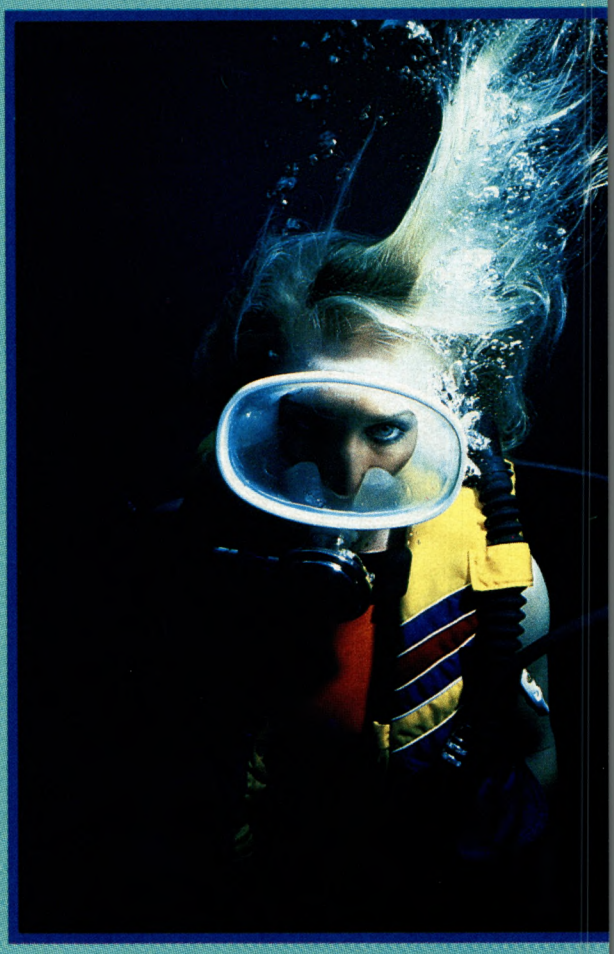
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1st Place Open Slides—Anemone City/Dorian Barker



1st Place Color Prints—Scuba Angel/Hal Martin



WINNERS:

The Houston Underwater Club is proud to present the winners of the Seaspace '85 International Underwater Photo Contest. These images were chosen from hundreds of entries submitted by divers from around the world. The categories were Open Slides, Novice Slides, Surface Slides, Slide Series, Color Prints, B/W Prints, Fresh Water Slides, Experimental Photography and Underwater Video.

In addition to the highly coveted Robert L. Straight Sea Symbols trophies, first place winners received prizes including trips to Aruba, Bonaire and Cayman Brac, courtesy Divi Hotels; Cozumel, courtesy Carlos Sierra and Poseidon Ventures; a Nikonos V camera, courtesy Nikon and Skylark Camera; and an Oceanic 3000 TTL strobe, courtesy Oceanic: There is also the thrill of seeing their photos printed in SKIN DIVER Magazine.

Seaspace '86 is scheduled for June 6-8 at the Shamrock Hilton Hotel in Houston, Texas. Photo contest applications, program information and ticket order forms are now available. The competition and prizes will be bigger and better than ever. Write now: Seaspace '86, P.O. Box 3753, Houston, Texas 77253-3753.



1st Place Novice Slides—Perfect Match/Brian Kearney

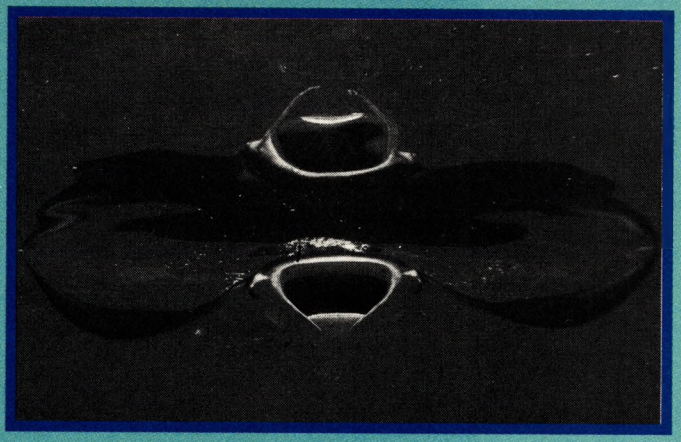
1st Place Surface Slides—Man With Tank/Lori Feiland



1st Pl. Fresh Water Slides—Praying Manatee/Jesse Cancelmo



1st Place Monochrome Prints—Sea Devil/Bob Kendall



SEASPACE PHOTO CONTEST

BY KEN KNEZICK



1st Pl. Special Effects Slides—Fishy Sunrise/James Creighton

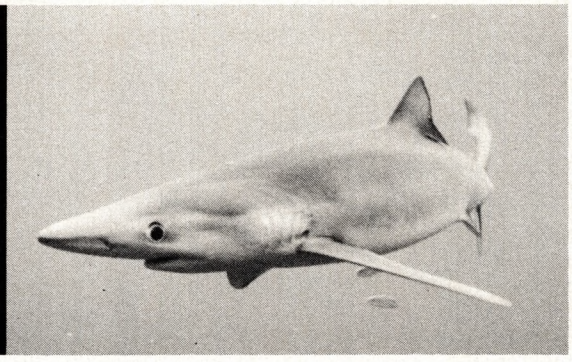


1st Pl. Slide Series (one of series)—A Love Story/John Leek

BLUE WATER BLUE SHARKS

High Voltage Action—Just Off The California Coast

BY JIM WALKER



photo/Bonnie J. Cardone

Blue on blue—when the first shark materialized beside the bait hanging from our vessel's stern I wasn't sure whether I was really seeing it. I had wanted to see it for so long, I could have been imagining it. There was nothing like the classic dorsal fin knifing through the surface that most people expect from sharks. The five foot long blue simply hovered near the bait, three feet underwater, not moving. Viewed nearly directly below me, the initial indicators of the sleek predator's presence were only a grayish outline separating the deep blue of its back from the indigo depths and a gray-yellow smudge on its nose.

Then it moved!

Effortlessly, the shark turned slightly and slid through the clear, blue water, disappearing almost instantly from my view. "We've got one!" I announced to the others aboard. And, still not positive I had really seen it, I added, "About a four footer, I think." (I was determined not to show my excitement by exaggerating its size.) Almost immediately everyone was gathered at the railing, searching the water below.

For a moment my greatest fear was that the shark wouldn't return and no one would believe I had seen it. But, then it materialized again, gliding by the bait—and everyone started talking at once.

There were eight of us aboard the *Hustler* out of San Diego, captained by Dick Howard. We were on a blue water/blue shark dive offshore Mexico's Coronado Islands. Our intimate group had been organized by Budd Riker and Susan Speck



photo/Jim Walker

Budd Riker of Divers West waits, bait in hand, for a blue shark to come in close.

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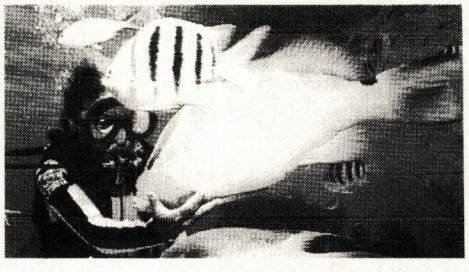
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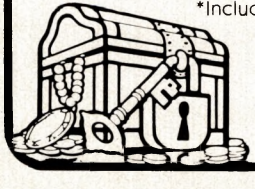




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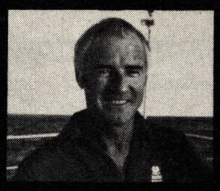
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Mastering Underwater Photography
The Undersea Predators
Diver's Guide to the Cayman Islands

FIJI ABOARD STA RETA

Dateline Suva: Most American divers have heard volumes about Australia's Coral Sea, The Red Sea and Truk Lagoon. About Fiji they have heard practically nothing.

In part that is because Fiji has remote great diving - and convenient poor diving. Divers have written me to say they were disappointed in the dives they were offered in the standard hotel packages. Poor souls; they were only 40 miles from one of the Pacific's grandest reefs.

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Why has nobody even heard of this undiscovered gem? Mainly because *Sta Reta*, the only live-aboard dive boat regularly offering Great Astrolabe, is too small to afford massive advertising.

See & Sea Travel sends small groups of 3-5 divers to *Sta Reta* throughout the April to November prime season. *Undercurrent* rated this cruise "near-perfect" and said "See & Sea's trip to Fiji is one fine adventure."

Fiji is also a superb choice for those of you who long for Australia's Coral Sea but find it too expensive; Fiji offers 80 - 90% of the thrills of the Coral Sea, at 60% of the cost.

Sta Reta is a charming 40 foot motor sailer, ingeniously designed to convert its daytime salon to evening sleeping accommodations. Captain Eric and his wife Keresi are such wonderful people that several clients have actually dissolved in tears when it was time to leave for home.

Diving at Great Astrolabe offers non-stop thrills: we've had immense schools of jacks, majestic manta rays, turtles, sharks - yet you want to look for close-up subjects as well. There are huge colonies of anemones with dozens of clownfish, butterflyfish, angelfish, sea snakes, delicate branching corals and a myriad of wonders beyond listing.

The Color Wall at Astrolabe runs from the surface sheer to ninety feet, and is carpeted with every color of soft coral you've ever wanted to see.

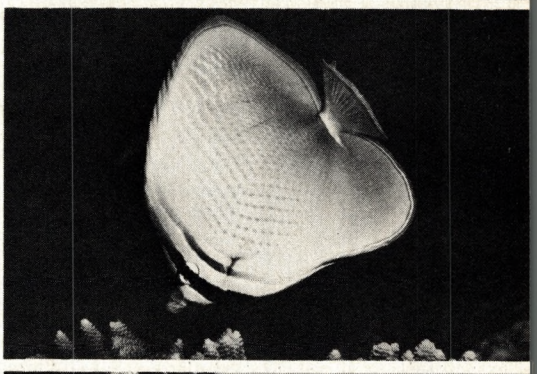
In the evenings we pull *Sta Reta* into a secluded sandy beach. Here in hushed stillness we watch the night sky blaze with countless awesome stars as we've never seen them before. Swim? Beachcomb? Sure - there's no one for miles to say no.....

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of Divers West in Pasadena, California. It was their seventh such charter and the five foot blue made them seven for seven at chumming in sharks. Despite the common misbelief that a cut finger will draw every shark for miles around, sharks are not all that easy to come by and Divers West's record is impressive. I have been involved with several fruitless chumming expeditions that didn't have the benefit of Riker's expertise.

On this day we had been chumming for two and a half hours before this first shark appeared. But, that brief initial encounter more than paid for the effort.

Our chumming consisted of releasing clouds of fish parts and squeezings (Budd's secret recipe) into the water through a plastic milk crate suspended from the *Hustler*'s dive platform. Budd, as a good guide should, had been doing the lion's share of the work, assisted by a couple of us not too repelled by the very smelly task. (Some of the chum was two weeks old!) When the first shark arrived, I had been attempting to speed the process by doing an imitation of grape crushing with my feet in the chum crate as it rested on the platform.

The blue shark, *Prionace glauca*, is a pelagic species found throughout warm seas. Off Southern California it is the shark most likely to be seen in open water. Reported to grow longer than 12 feet, the average size in these waters seems to be under six feet.

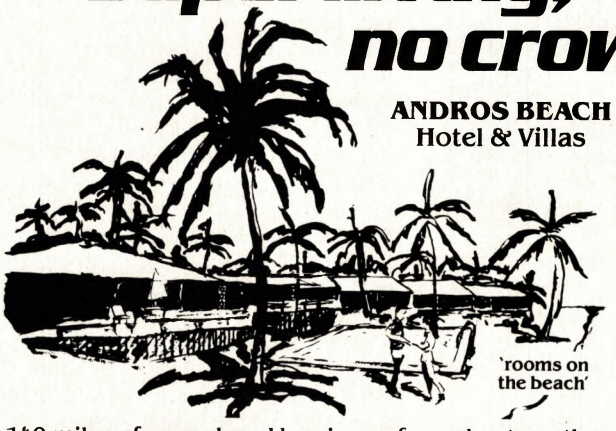
The blue is felt by many to be the most beautiful of sharks and, on this day at least, I agreed. A slim, elegantly tapered torpedo, the blue shark has a deep, iridescent blue back, fading through gray on the sides to a white underbelly. The pectoral fins are long and tapered. And, the eyes—well, they're downright exciting. Appearing in many photos as dark holes, viewed up close they are more like cat's eyes than fish eyes. Resembling a tiger's-eye stone, the eyes have pupils that are only slits, even in dim light. We waited for three of these beautiful animals to show before we started the dive.

While not normally aggressive, the blue has a full set of sharp teeth and can bite off 20 pound chunks of bait in seconds. With this in mind, plus the ever-present possibility of more aggressive sharks, such as makos, showing up, Budd's shark cage preceded us into the water. Budd, armed with an explosive powerhead (unloaded, but shells at the ready), entered the water first. He would serve as our underwater sentry and entertainment director. The rest of us were armed only with cameras.

In quick succession, several of us, including my dive buddies Bonnie Cardone and Ron Akeson, entered the cage—

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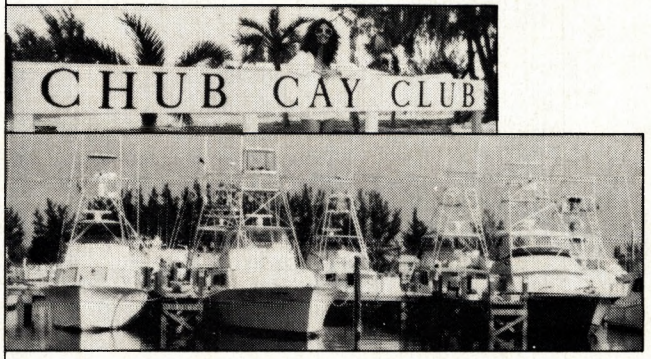
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photo/Ron Akeson

briefly. (Those waiting for the next dive kept the chum going.) The cage turned out to be a refuge of last resort as it bounced about roughly in the swells and chop. However, a moderate current was running and this, combined with the sudden "cameraderie" we all felt, kept us in close proximity to the cage.

My personal interlude in the cage was limited to fine tuning the setting on my camera system. Braced inside, I ignored the action outside until all systems were go. When I did venture out I was disappointed to see our sharks had left us. Hanging onto the cage and cursing my luck at missing the animals, I was unsure, at first, when the next shark appeared. It simply materialized out of the blue, coming slowly, right at me. Although it was only a five foot, slim, blue shark, it suddenly took on an amazing resemblance to posters of the great white.

Dreamlike, the gorgeous, yet threatening animal slid toward me. I had seen this same sequence in many movies and still photos and I felt as though I was watching a movie even there. I literally had to shake my head to clear the sense of false security I was getting from the shark's fluid, lazy approach. Maybe that's part of the blue's *modus operandi*—hypnotizing its prey.

The shark covered the last few feet between us exquisitely slowly. Its only movement seemed to be the eye nearest me, which rotated up and down as it sized me up. It came in closer and closer until I finally had to threaten it with my "lethal" strobe. Then it simply passed by and went on to examine the other divers as closely as they would let it.

I don't remember taking any photos on that first approach, but the scene was repeated many times, allowing many pictures. Naturally, as the dive wore on we all became much bolder with the sharks, even to the point of grabbing a tail or petting their sides as they passed. Budd attempted to hand feed them but they were amazingly wary about biting anything.

A few of us made a second dive later in the afternoon. The situation was much the same except that at one point we had four blues checking us out at once. They would come in when you least expected it and seemed to like cruising up behind you when your attention was on another shark. Also, as the daylight dimmed, the sharks became just a touch bolder and moved just a little faster. Although they had seen us all afternoon, their curiosity seemed to be growing rather than diminishing—after all, they are said to be active night feeders

Is blue shark diving for the masses? No. Only experienced, confident divers should attempt it, and then only with an experienced guide under controlled conditions. But, for those as fascinated by sharks as I am, it's a terrific experience.

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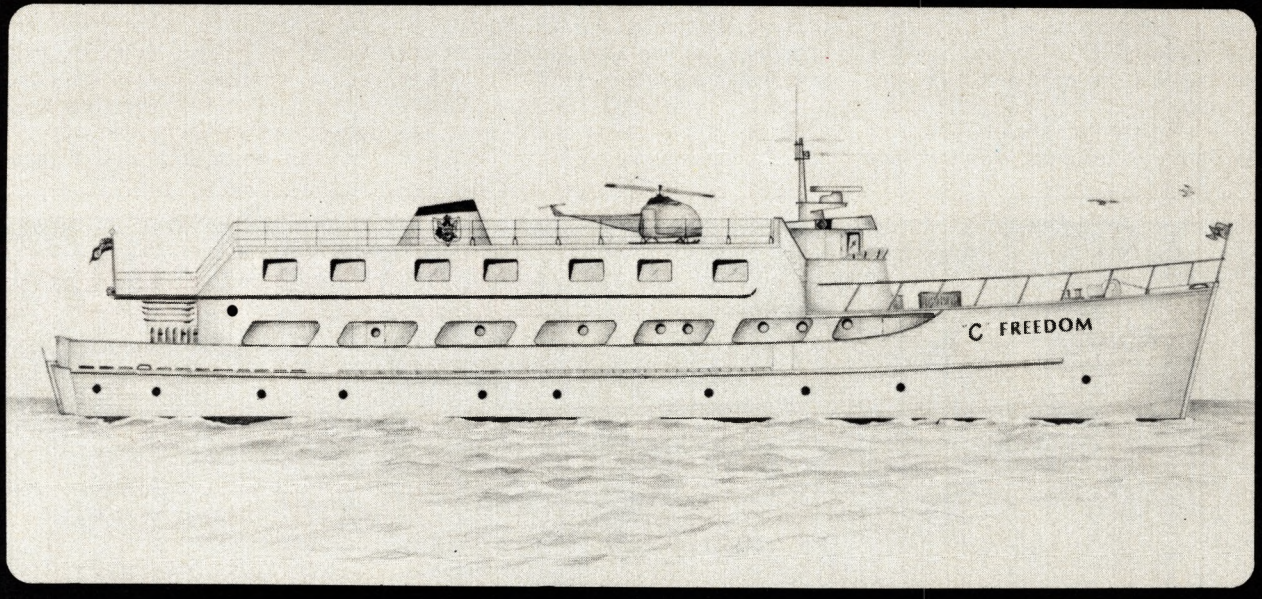
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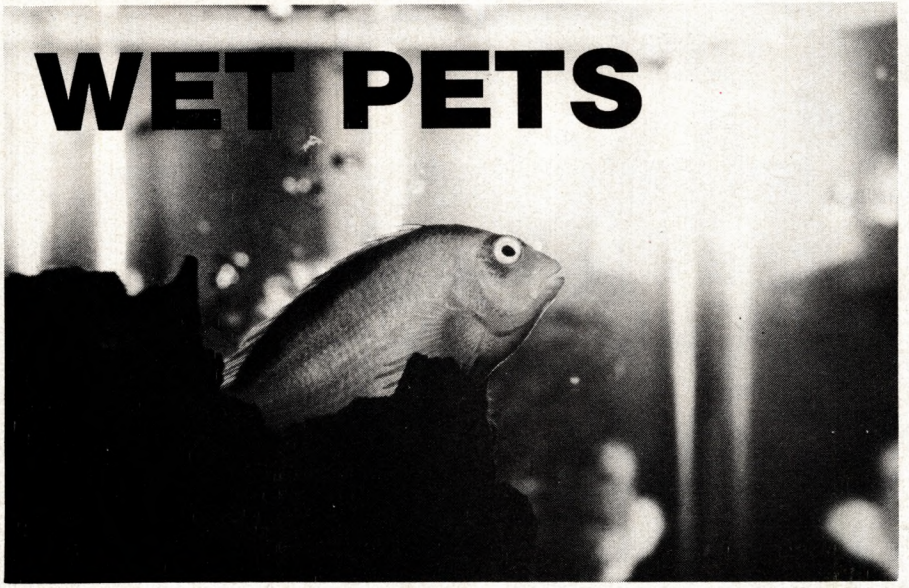
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photos/Steve Malone

These Little U/W Personalities Are A ½ Billion $ A Year Business

BY HILLARY HAUSER

Kevin Franks picked out his tropical fish because they are "macho," but bangs on his aquarium when his most aggressive fish gets out of line.

Jerry Beaver's favorite fish is an angelfish that's "got personality."

Jack Huthsing likes all his fish—because they're more animated than postage stamps.

These tropical fish aficionados from Santa Barbara, California, say their wet pets are more than a hobby—that they are little underwater personalities that have taken over their living rooms, stores or offices.

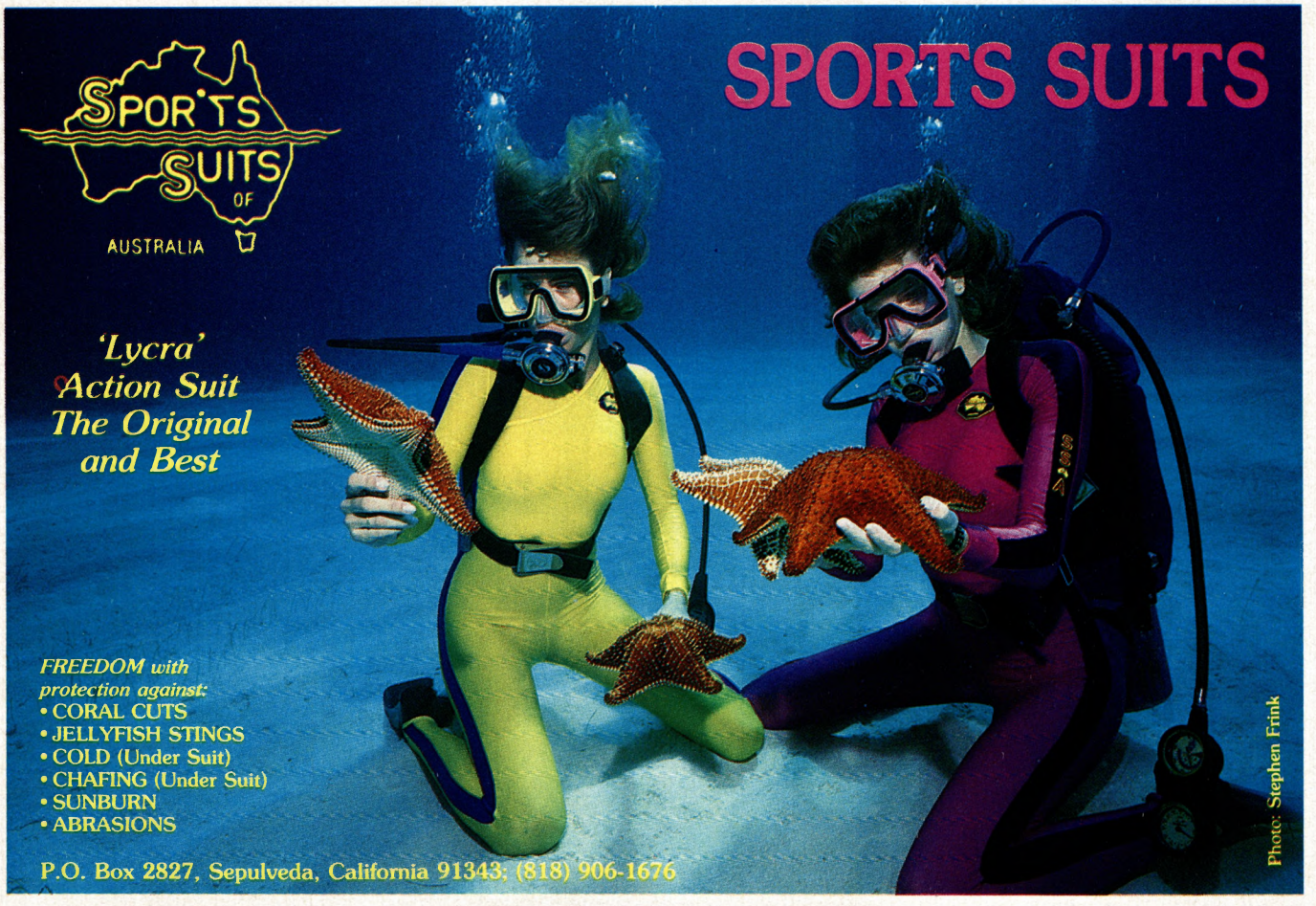
Some fish owners are divers who have become attached to the sea life they go underwater to see. Some owners of wet pets install aquariums in their offices to entertain waiting clientele. Some aquarists would rather watch their fish than the latest show on TV.

Whatever the motive, a survey of more than 10,000 independent pet stores by Pet Supplies Marketing reveals that tropical fish sales rose from $180.2 million in 1982 to $251.7 million in 1984—an increase of about 40 percent.

During the same period, sales of aquariums and supplies rose from $251.8 million to $315.5 million.

Fish ownership is clearly becoming big business. Fish collecting is lucrative employment, too, and is usually done by divers (some fish are taken incidentally in the nets of fishermen). Win Swint, a commercial abalone diver in Santa Barbara who collected marine tropicals in Florida in the late 1960s, said the work is not all fun and games.

Swint explained that divers use nets to catch their prey, never chemicals ("that burns their gills"), and that underwater collecting of fish is not as easy as picking up $50 bills. The diver has to pick an open area where he can work ("preferably an open area with a huge, high



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reef"), then try to startle the fish out of their hiding places, usually by dragging some type of noisemaker across the reef.

"You drive yourself nuts chasing them around a field of staghorn coral, while they just laugh at you," Swint said.

Once the collected fish find their way into the tank of an avid aquarist, they begin to capture hearts. Fish owners on vacation are known to place telephone calls to their fish sitters to ask about their underwater pets and to visit their sick fish in the intensive care wards and hospital rows set up in aquarium stores.

Saltwater fish, most aquarists agree, have more pronounced personalities than the freshwater species. ("It's the same difference as between color or black and white television," said one saltwater enthusiast.)

Fish-sellers also say that people buy fish that match their own characters.

Kevin Franks, who owns the Underwater Sports dive store in the Santa Barbara harbor, said he installed his 180 gallon saltwater aquarium in the middle of his display area to show his potential customers what they'll be seeing when they go diving.

As Franks talked about his fish, however, it became obvious they are more than sales promoters. "All the fish in my tank are hardheads, like me," he said. "But they're soft and kind inside. Anyone messes with them, they're rebellious and aggressive, but in their own space, they're cool."



Bob Davis with freshwater aquariums.

Franks said that every day a string of people come into his store just to visit his fish. His favorite character in the tank is a bright orange and white striped wrasse from the Great Barrier Reef, which he has named The Exterminator. The name fits the fish, Franks said, because it "mows down everything in its path and cruises around cool-like."

"Personality is what makes this hobby neat," said Jack Huthsing, a UCSB building maintenance supervisor. "Compare it with other hobbies, like stamp collecting. It's pretty hard to buy an aggressive stamp—they just lie there in the book."

Some aquarists see their fish as decorations—a living painting, so to speak. Andy Woodward, who owns House of Aquariums in Santa Barbara with his brother, Dana, said people buy fish to match a couch or curtains.

Jerry Beaver, who owns a prominent real estate investment business in Santa Barbara, said he installed a 240 gallon aquarium in his downtown office as a room divider, but has since grown attached to one of his angelfish. "It's got personality, is the prettiest and comes



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right up to you," Beaver said.

Expanding with the national interest in this hobby are the size and complexity of aquariums. House of Aquariums has a $12,000 coral reef, built into a Santa Barbara home. Andy Woodward said that one client ordering a custom aquarium for a wall of his house asked the builders to continue into the kitchen and remodel it, too.

Susan Huthsing recalled the loss of a favorite fish. "We had a queen angel that died in a heat wave," she said. "I was bummed, he was my favorite fish. We had watched him change from a two-inch baby to just about adult. I put my hand in the tank, wanted to touch him. He was such a beautiful fish."

Her husband said he was upset, too. "Any time you flush a $100 bill down the toilet, it's disappointing."

The expense of a saltwater aquarium has been cited as the main reason more aquarists have stayed with freshwater tanks. The Huthsings have spent about $1,000 on their saltwater system—and the tank and filter (the most expensive parts of aquarium ownership) were wedding presents.

Franks has spent about $2,000 on his aquarium and Beaver estimates he has $7,000 invested in his room divider.

Bob Davis, co-owner of Aquatic Designs, Santa Barbara, said a beginning freshwater aquarium (usually 10 gallons) sells for $29, whereas an introductory saltwater system can go for $200.

In spite of the expense, more people are buying marine aquariums. Davis said about half of the aquariums sold are for saltwater fish, whereas four years ago, they were only 20 percent of the market.

Prices for saltwater tropicals range from $1.98 for a bright blue damselfish to $300 for certain Indo-Pacific angelfishes, with the average price between $40-50. The fish becomes more valuable as it grows. A juvenile angelfish costing $50 may be worth $100 or even $150 by the time it reaches adulthood.

Responsible fish sellers don't just sell a fish to anyone. They find out first where the fish is going and if it will get along with its tankmates.

Many fish are territorial and a new fish may be swallowed alive by an aggressive older fish—or nipped so badly that it develops the dreaded fungus disease called ick.

The first to go into a saltwater tank are starter fish—those with hardy constitutions that can survive just about anything. Common starters are damselfish—pugnacious, territorial characters that will live through the most difficult circumstances.

"The psychology of a tank is to start with the tough, aggressive fish, just to

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make sure the tank will support them," said Davis. The damselfish, he said, can practically live without any salt at all.

Once the tank proves inhabitable, the damselfish can be "returned for credit," which is usually half of what was originally paid, Davis said.

With the tank cleared, the aquarium is ready for the more peaceful fish—the angelfish or triggerfish. By giving the gentler fish a head start on establishing their territories, the more aggressive ones that come later are slowed by the fact that there have been others ahead of them.

Franks, however, has one fish—a blue devil damselfish from Fiji—that has apparently never gotten the message about how it should behave. The damselfish, he said, is a starter he decided to keep as his other fish were added.

"He thought he was hot stuff; ate the tail off another one," Franks said. "That made us mad. We tapped the tank and that hurt his ears. Then, he killed a fish and that made us really mad and he knew we were mad. Then, we put in the 'real' fish—the triggerfish and so on, and it was all over for that guy. We watched him and laughed. His whole attitude changed. He looked at us and glowered."

Franks said he subscribes to a maintenance service from the store where he bought his aquarium. This way he can enjoy his fish and leave their problems to the experts in the store to handle.

Maintaining a saltwater aquarium is more complicated than keeping a freshwater system, but it has become easier with dried ocean water that can be taken home in bags. One brand is called Instant Ocean, another, Marine Environment.

Or, you can take your five gallon, home-delivered, drinking water bottles to an aquarium store and load up on premixed salt water for about 40 cents a gallon. Most people take care of their own aquariums—their own way.

Miriam Shiffman, a California aquarist who gave away her fish when she last moved, said she kept her aquarium perpendicular to the San Andreas fault, "so that it wouldn't tip over in an earthquake." But, Miriam also played music to her underwater pets so they'd have something to swim by!

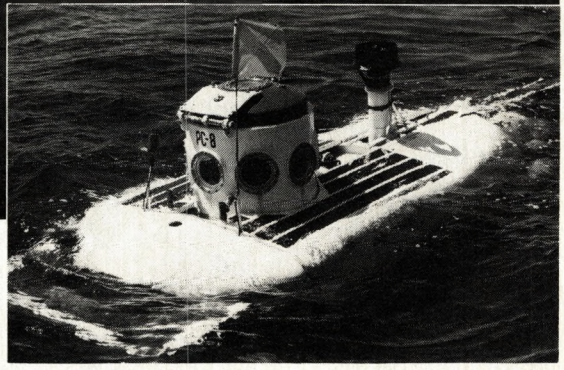
People are affected by their fish physiologically too: Medical studies have shown that gazing at an aquarium lowers blood pressure and reduces stress—which is why more doctors and dentists are installing aquariums in their waiting rooms, according to the Woodward brothers. But when one forlorn aquarist overheard this, she didn't agree with the medical findings. "Don't tell me about reduced stress!" she said. "I lost my fourth fish yesterday!"

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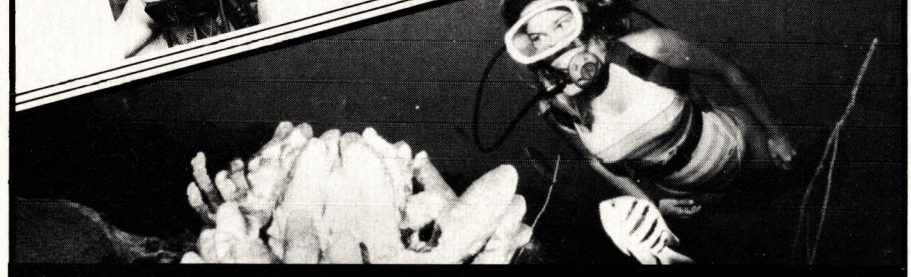
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DUTCH SPRINGS

(Continued from Page 89)

ment would be generated by the quarry's fame. But because the number of divers is still relatively small, its water clarity has been preserved, enhancing its appeal.

Dutch Springs is situated amid the triple cities of Allentown, Bethlehem and Easton, Pennsylvania and is easily accessible off I-78, 50 miles north of Philadelphia. Divers have been attracted there from New Jersey, New York, Maryland and of course, Pennsylvania, with a full



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SHORT SHOTS
BY CARL KOHLER

Off California's Channel Islands, at a great depth, two fish—one older, one younger—were watching a submarine firing practice torpedos. Three times, a missile shot from the sub in a violent burst of bubbles, sped swiftly for a distance, struck an underwater target and exploded into shards.

"Those poor escapees can't handle sudden freedom," said the older fish.

"Really?" murmured the younger fish.

"If they could," the older fish assured him, "they wouldn't be going all to pieces over it."

Texan Jim Bob had been skin diving for 15 of his 30 years but his underwater experience had been limited to various lakes, large and small. Then came the opportunity to visit the West Coast and actually dive in the Pacific Ocean he had heard about for years.

Arriving in California, Jim Bob suited up and went directly to the nearest beach. Entering the surf and going underwater, he began finning his way parallel to the shore. After three miles, he surfaced and shouted a question at nearby fishermen in a boat. They ignored him. So he submerged again for another five miles before surfacing and yelling the question at a waterskier who also ignored him. Perplexed, Jim Bob dove a third time, covering a distance of seven more miles, again surfacing and, this time, swam right up to a pier where a crowd at the railing looked down at him.

"Listen, y'all," pleaded Jim Bob. "Where's the dam?"

Two skin divers—experienced George and novice Fred—were exploring an offshore reef new to both. Suddenly, George saw an unusually huge and exotically marked nudibranch frantically undulating toward a thick kelp bed.

Using standard hand signs, George swiftly signaled a brief and excited description of the departing mollusk, giving its direction and destination. But, before George could propel himself after the rare find, Fred grimly grabbed him and began swimming to the surface.

"Wh-What do you think you're doing?" gasped George.

"Saving your life," Fred replied, panting.

"Don't you understand underwater sign language?" George snarled, disgusted.

"Heck, no," Fred admitted. "I thought you were having a seizure of some kind."

Every day, the elderly man appeared at the small town's waterfront. Fully garbed for skin diving, complete with three scuba tanks, he boarded a small boat and started its outboard engine. One-half mile beyond the harbor entrance, he dropped anchor and unhurriedly plunged into the water.

Three hours later, he surfaced, clambered back into the boat and returned to the dock. Finally, one curiosity-ridden young dockhand asked: "What's an old guy like you doing out there every day?"

The oldster smiled patiently. "After 45 years of professional salvage diving, pipeline repair diving, spearfishing, voluntary body recoveries and underwater commercial photography—I'm sensibly just sitting on the bottom, enjoying the beauty of my surroundings, which I missed during all those busy dives, sonny."



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SOUTHERN RED SEA

(Continued from Page 76)

cate corals with clouds of fairy basslets hovering above them. And, the water is so warm that I am comfortable after hours of photographing on the bottom.

The new, ten-day Sudan dive cruises begin in April. I'll have the pleasure of escorting the inaugural April 10-24.

If you are hesitant about diving out of Israel or Egypt, yet long for the finest in Red Sea diving, this could be just the adventure for you. Here, in a sleepy corner of the Red Sea, the dolphins, barracuda, rays, wrecks, sharks and other photo subjects wait in a warm paradise. For more details, airline reservations and side trips, call or write See & Sea Travel at 680 Beach Street, #340, San Francisco, California 94109, (800) DIV-XPRT or (415) 771-0077.

This is one of diving's great new finds. I look forward to welcoming you to this arena of my young dreams.

COMET PACKAGE

Few people realize that Sir Edmund Halley, famous for calculating the path of the mighty comet later named for him, was also the inventor of the first diving equipment. He created and tested the forerunners of the modern diving bell, helmet and dive suit in the 1600s. Combining Hailey's two obsessions, the Bonaire Scuba Center, at the Bonaire Beach Hotel, is offering a special Halley's Comet Sea and Sky Vacation from April 5-12. Only 10 degrees north of the equator, the Caribbean island of Bonaire will offer an ideal viewing spot for the comet. In April it will be only 39 million miles from earth.

Fran Decibus, director of the Carl Sandburg Middle School Planetarium since 1968, will lead the nightly skywatch and host daily lectures, slide shows, contests and parties about the comet itself, Sir Edmund Halley, general astronomy and humorous footnotes from previous comet sightings.

The package, based on double occupancy, includes roundtrip airport transfers in Bonaire, air-conditioned accommodations with private bath for seven nights at the Bonaire Beach Hotel, welcome cocktail, $5 casino chip at the hotel's Black Coral Casino, two meals daily (breakfast and choice of lunch or dinner), Tuesday night cocktail party, free use of tennis courts and mini-golf course, six guided reef trips and unlimited air fills for additional shore diving (divers only), all special programs presented by Decibus, and hotel taxes and service charges.

For more information or reservations contact Al Catalfumo, Bonaire Scuba Center, P.O. Box 775, Morgan, New Jersey 08879; (800) 526-2370; in New Jersey (201) 566-8866.

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For much more than just a diving vacation...



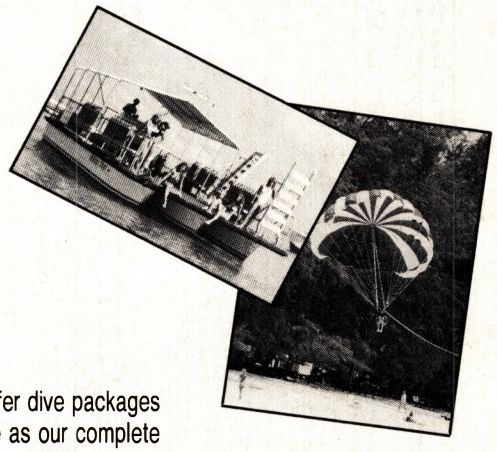
INTRODUCING . . . SURFSIDE'S NEW DIVE OPERATION located on the island of SAINT EUSTATIUS, NETHERLANDS ANTILLES at the lovely "OLD GIN HOUSE" hotel. INTERESTED IN DIVING SOMEPLACE SPECIAL? SOMEPLACE WHERE THE MARITIME HISTORY IS SO THICK YOU CAN TOUCH IT! Imagine diving in a place where very few people have ever been diving before, and also consider this . . .

- St. Eustatiùs was the first foreign power to recognize the sovereignty of the United States on Nov. 16, 1776.
- "Statia" was the original "Golden Rock"—the wealthiest island in the Caribbean during the 17th & 18th century.
- In its 18th century heyday over 3000 ships a year made Statia's one Bay their port of call.
- There existed on Statia a maritime and commercial exchange such as the world never before had known.
- Ships of every design and flying flags of all colors anchored in Statias Bay.
- Virtually all commerce of any importance, honest or illicit, was diverted through Statia.
- Practically all traffic between Europe and the American colonies was conducted through Statia.
- Noted historians believe that between battles, storms and collisions, there are more than 200 ships sunk in Statias untouched bay.
- April 6, 1690, an earthquake casts more than half the town into the sea—warehouses full of plunder and contraband.
- Access to dive historical ST. KITTS (6 miles), SABA (13 miles), ST. MAARTEN (34 miles).
- Crystal clear 80° water; friendly native people; many interesting places to visit, uncrowded beaches.
- Ongoing archaeological projects, research library, museum, underwater photography.
- Excellent accommodations with absolutely great food—THE OLD GIN HOUSE—THE INNS AT GALLOWS BAY.

WE ARE NOT SURE WHAT YOU WILL FIND ON THE BOTTOM WHILE DIVING WITH SURFSIDE AT STATIA. YOU WILL FIND *SURFSIDE-STATIA* TO BE A PROFESSIONAL, ACCOMMODATING, WELL EQUIPPED, WELL RUN DIVE OPERATION; YOU WILL FIND EXCELLENT FOOD AND ACCOMMODATIONS AND YOU WILL FIND A BEAUTIFUL ISLAND WITH FRIENDLY PEOPLE. CALL OR WRITE OUR U.S.A. SALES OFFICE FOR MORE INFORMATION AND RESERVATIONS.

SIMPLE ADDITION . . .
SURFSIDE ON SEVEN MILE BEACH + SURFSIDE AT RUM POINT (NORTH WALL) = ULTIMATE VACATION

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The people at Surfside are constantly trying to give our customers everything possible to make their Cayman vacation complete. It is for this reason that we have opened up a new location on Cayman's North Side. We now offer you total access to the fabulous North Wall.

Introducing . . . SURFSIDE—RUM POINT

Our newly opened dive operation at Rum Point on Cayman's beautiful North Side allows us to offer packages with a number of fine resort hotels and condominiums. Individual/group packages at the beautiful *Retreat at Rum Point* and at *Villa Caribe Resort*, complete with excellent native and American cuisine, are now available at reasonable rates.

SURFSIDE WATERSPORTS ON SEVEN MILE BEACH

with locations at Beach Club Colony Resort and at Le Club Cayman Resort Hotel, continues to offer dive packages with a variety of excellent hotels and condominiums on Seven Mile Beach. These locations serve as our complete watersports headquarters. For fun and enjoyment that doesn't exclude anyone, we offer parasailing, jetskiing, paddleboating, windsurfing, sailing, glassbottom boat trips, snorkel trips and much more.



NOW YOU CAN HAVE THE BEST OF BOTH SIDES . . .

A Surfside dive package will allow you to dive at both locations. If you so desired you could dive the North Wall in the morning and the wreck of the "Oro Verde" in the afternoon! Perhaps you want to dive the wall in the morning and use your watersport voucher (free with dive package) to go parasailing! If your dive is blown out on the North you can dive with us on the West Side, you will always have great diving available with Surfside. Perhaps you want the tranquility of the North Side for three days and the activity of Seven Mile Beach for three days . . . just let us know and we'll arrange it.

SURFSIDE U.S.A. SALES OFFICE
330 South Main Ave., Scranton, PA 18504
(800) 468-1708
In Pennsylvania **(717)346-6382**
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The Diving—Bob Soto's Diving Ltd., the island's only PADI 5-star diving facility picks you up in the most comfortable, drop-front boats available. **$499.00**

Package Includes—7 nite accommodations • Manager's Rum Punch Party on Tuesday night • breakfast daily • 6/2 tank dives • 1 night dive • R/T airfare from Miami • plus much more

Effective April 1 through December 15, 1986

Three nite package per person, double occupancy **$229.00**

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Prices do not include the 10% service charge and 6% government tax which will be quoted at the time of booking.

Your dive boat will operate every day—GUARANTEED
Your room reservations are confirmed every day—GUARANTEED
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All the diving with all the comforts—guaranteed. Write: U.S. Reservations Office, The Holiday Inn Grand Cayman, 5100 Poplar Avenue, Suite 2219, Memphis, Tennessee 38137.

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ROYAL ISLANDER

The Royal Islander Club and Hotel, Honolulu, Hawaii, is marketing inclusive tourist and sport packages. This includes everything from airport transfers and accommodations through major scheduled activities. The program provides travelers and agents with a single contact—the hotel—to help ensure guest satisfaction.

According to Miles Baidack, general manager, "The Royal Islander Vacation Packages bring all the variables to our front desk. Our staff will schedule activities, have transportation ready to move the guests, accompany groups when necessary and handle problems on a first-hand basis."

The Royal Islander vacation packages in golf, tennis and scuba diving include a full schedule in each sport plus selected Hawaii attractions, hotel accommodations, welcome party, airport and local transfers and rental car use.

The Royal Islander is at 2164 Kalia Road in Waikiki. For additional information, contact: Miles Baidack, General Manager, Royal Islander Club and Hotel; (808) 922-1961.

GALAPAGO INN

The Galapago Inn, a scuba diver's resort in Cozumel, has added a tiled freshwater pool and restaurant/bar.

Reasonably priced packages for individuals and groups are available. Contact Tim or Paty Massimino, P.O. Box 289, Cozumel, Q.Roo, Mexico 77600 or call (800) 847-5708 or (713) 783-3305.

PORTS OF CALL

Prospect Promotions, Ltd., has made available the M/V *Ports of Call* for group dive charters in the Cayman Islands. Based on Cayman Brac, the vessel is a steel hulled, 112 foot live-aboard that features ten air-conditioned staterooms, gourmet cuisine, bar and lounge, color TV with VCR and a complete dive station.

For information contact: Prospect Promotions, Ltd., 7322 Southwest Freeway, Suite 850, Houston, Texas 77074; (713) 541-0915.

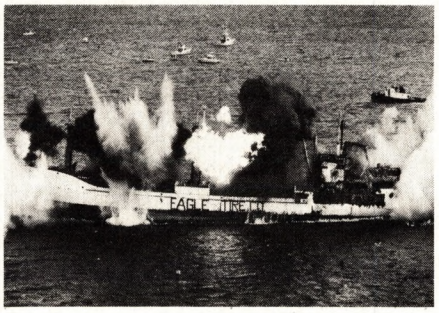
CAYMAN SUB DIVES

Research Submersibles Ltd. of Grand Cayman offers dives to 800 feet on the West Wall at Grand Cayman aboard the PC 8-B submersible. Additionally, a recently discovered wreck site can be explored aboard the sub: The *Kirk Pride*, a 485 foot freighter, virtually intact, still holds a cargo of beer and a Volkswagon.

For more information contact: Research Submersibles Ltd., P.O. Box 1719 Grand Cayman, BWI; phone (809) 949-3870.

ISLAMORADA SHIPWRECK

First there was a dull roar. Then a sheet of flame burst from the ship. A dense plume of thick black smoke billowed from the freighter as she leaned to starboard and slipped quickly beneath the sea. No, it wasn't a scene from a World War II naval battle movie. It was, however, the sinking of the *Eagle Tire*, a 287 foot dere-



lict freighter four miles offshore Islamorada, FL—in 120 feet of water—providing an artificial reef site.

Prior to the sinking, the ship was cleaned up—to prevent chemical pollution—and work crews cut holes through decks in the ship to facilitate movement by divers and marine life.

Nearly 100 boats gathered recently to witness the spectacular explosion of the vessel, previously named the *Arron K*. The dynamite exploded on time at noon and at 12:02 pm the ship settled on her starboard side on the sandy bottom.

"We originally anticipated the vessel settling on the bottom upright," said Ken Wright, a project organizer who dove the site the day after the sinking. "We thought it might be a problem since it landed on its side, but explosives ripped huge holes in the hull, so daylight shines through from any part of the wreck.

"A week after she sank divers spotted a dozen amberjack, barracuda and glass minnows. In another three or four months the *Eagle* will be loaded with mangrove snappers, some grouper and other assorted species."

Loran C coordinates for the artificial reef are 14093.0 and 43293.0 and the vessel has a relief of 50 feet.

The artificial reef project was sponsored by Upper Keys and Islamorada Chambers of Commerce, Keys Association of Dive Operators, Florida Keys Artificial Reef Association, Eagle Tire Company, North River Terminals, Holiday Isle Resort and the Monroe County Tourist Development Council.

ANTHONY'S KEY NIGHT LIFE

Anthony's Key Resort recently opened a casino, restaurant and nightclub (the first casino in the Bay Islands). It will have the Caribbean atmosphere for which Anthony's Key Resort is famous.

For more information call (800) 227-DIVE, in Florida (305) 858-DIVE.

At Don Foster's Grand Cayman, summer rates take a dive.

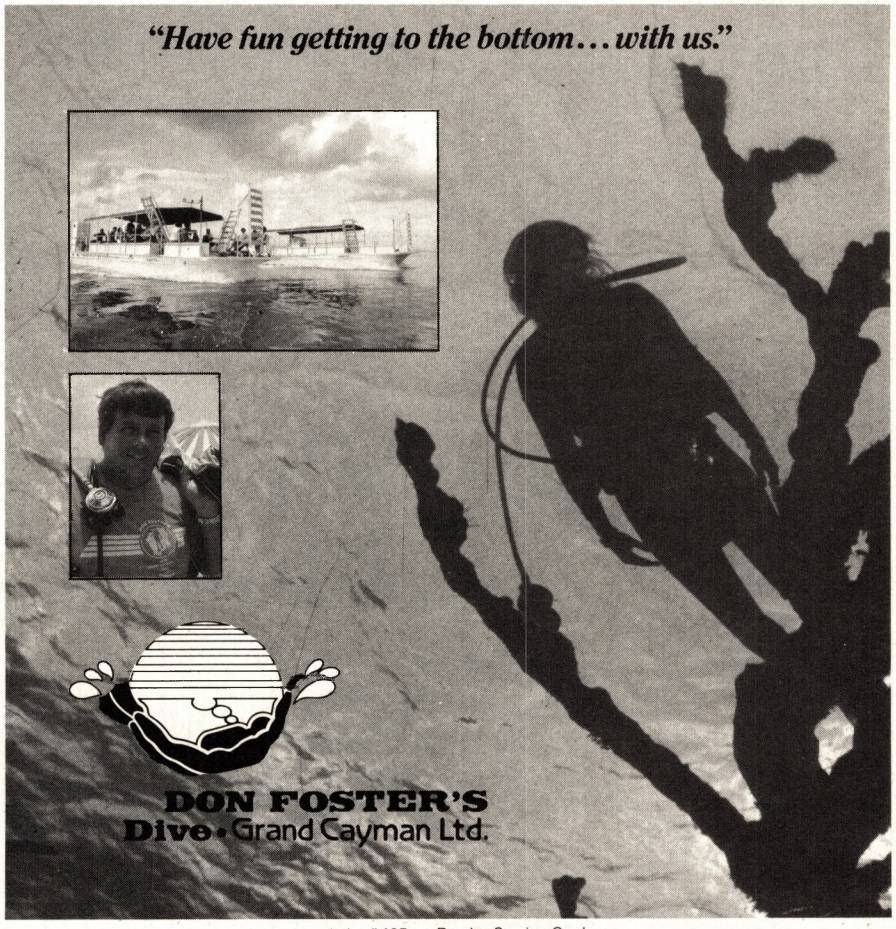
THE ROYAL PALMS OF CAYMAN

You'll stay at the fabulous Royal Palms of Cayman Hotel on an incredibly beautiful stretch of Seven Mile Beach. Enjoy all the amenities of a full-service oceanfront dive resort.

- **Personalized service... as much or as little as you wish.**
- **6 custom "state of the sport boats" to dive from.**
- **Daily two-tank boat dives.**
- **Tuesday Treasure Hunt—win a Cayman Dream Vacation.**
- **One night dive. (with 7-night stay)**
- **A one tank afternoon dive with night dive upgrade (6 nights stay or less).**
- **Unlimited airfills for offshore diving.**
- **Weights, belt and backpack included.**
- **Boat or van transport at all 7-mile beach locations.**
- **PADI/NAUI/SSI/YMCA training facility.**
- **Full service underwater photo center/ exciting underwater photography shows.**
- **Exclusive Scuba Pro dealer/ complete gear rental.**
- **Duty free shopping.**

Only $183. for 4 days and 3 nights/ $434. for 8 days and 7 nights (per person dbl. occupancy.) Contact: SCUBA TOURS, INC., 1-800-526-1394. In New Jersey: (201) 256-9115
(Gov't. tax and gratuities not included).

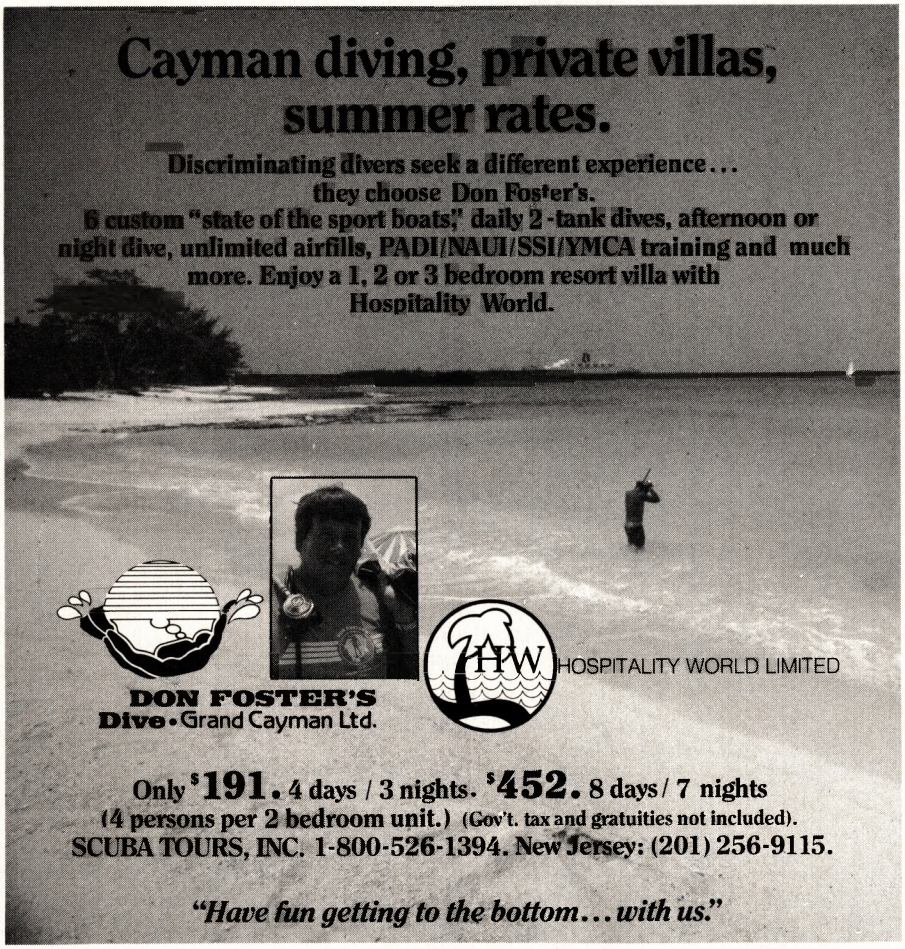
Cayman Airways



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Cayman diving, private villas, summer rates.

Discriminating divers seek a different experience... they choose Don Foster's. 6 custom "state of the sport boats," daily 2-tank dives, afternoon or night dive, unlimited airfills, PADI/NAUI/SSI/YMCA training and much more. Enjoy a 1, 2 or 3 bedroom resort villa with Hospitality World.



DON FOSTER'S Dive • Grand Cayman Ltd.

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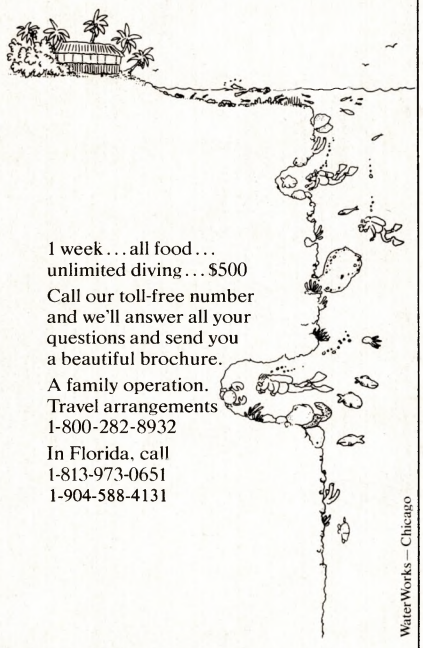
Only $191. 4 days / 3 nights. $452. 8 days / 7 nights
(4 persons per 2 bedroom unit.) (Gov't. tax and gratuities not included).
SCUBA TOURS, INC. 1-800-526-1394. New Jersey: (201) 256-9115.

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110 foot wall

a snorkel away from the bar



1 week... all food... unlimited diving... $500

Call our toll-free number and we'll answer all your questions and send you a beautiful brochure.

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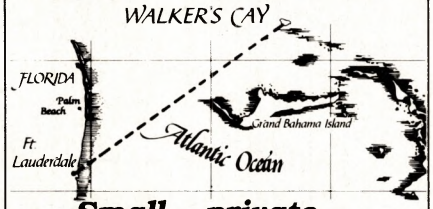
In Florida, call 1-813-973-0651 1-904-588-4131

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The relaxed little island in the Bahamas just 45 minutes away.

$289*
3 DAYS/2 NIGHTS
Includes:
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ULTIMATE SCUBA

Ultimate Scuba of Pacific Grove, California, is offering charter dive trips aboard the 55 foot *Holiday II*. The trips, to dive sites in the Monterey Bay area, include transport of divers and gear from free parking. Also included are a buffet lunch, beverages, soup, fruit and candy. (Divers supply their own gear, including two tanks each.) Groups of up to 22 divers are invited to charter the vessel (split charters are available).

For information contact: Ultimate Scuba, P.O. Box 51867, Pacific Grove, CA 93950; (408) 373-8639.

VIDEO CREATIONS TRANSFER SYSTEM

Video Creations of Rockmart, Georgia will celebrate its first anniversary in its new facility outside the metro-Atlanta area. Video Creations features a talking video computer system called Goldie. This is a complete computerized video transfer system in which all transfer equipment is housed. It is the second of its kind to be installed in the United States. With this new system, Video Creations can transfer 8mm film, super 8mm, slides, prints, negatives, sketches and art work onto VHS or Beta. Anything from 11 x 14 down to negatives can be transferred. Video Creations has a color processor to enhance faded film or photos.

Goldie can title with computer graphics or add special effects such as zoom in and out, fading in and out, fogging and more. After the transfer, stereo sound can also be transferred as a background for added entertainment. A safe return of your originals is guaranteed.

For more information contact Kay and David Chandler at: Video Creations, 103 S. Marble Street, Rockmart, Georgia 30153.

FREQUENT DIVER DISCOUNTS

See & Sea Travel of San Francisco is offering a program of discount dive travel for frequent divers. Members who join the new program will immediately receive discounts of 10 percent on all See & Sea dive trips. In addition, certain dive trips will be designated Sea Savers at discounts of 20-30 percent.

Divers who take two or more dive trips with See & Sea in any calendar year are now guaranteed to save money on their diving adventures. The more trips you take the more you save. Savings of $100 to $1,000 per vacation are possible under this new program.

Membership applications and further information are available from See & Sea Travel, Inc., 680 Beach Street, Suite 340 Wharfside, San Francisco, CA 94109; (415) 771-0077.



Cayman's Mobile Dive Resort

If you can't bring the reef to your room, then bring your room to the reef. Spend a week aboard the fabulous CAYMAN AGGRESSOR—90 feet of spacious, gracious pleasure.

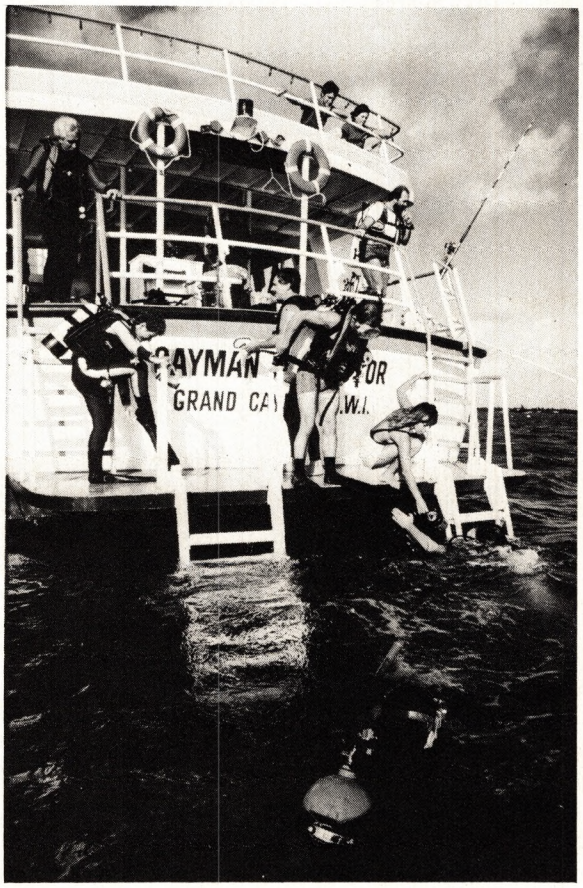
Why settle for only 10% of Grand Cayman's fabulous reefs and vertical walls? You can dive all of Grand Cayman and reach those virgin dive sites not normally frequented by other resorts.

You will love our no hassle diving routine. Slide out of bed and slip into the water with the greatest of ease. No need to lug heavy gear long distances—our reefs are 35 feet under your bunk. Dive any time of the day or night and make as many dives as you like.

The CAYMAN AGGRESSOR is more than just a dive boat. It is a full activities dive resort complete with spacious dining room, solarium, photo processing lab, mini boutique, U/W camera rental department and watersports center.

For more information and reservations call **800-DIV-BOAT.** CAYMAN AGGRESSOR, P.O. Box 99, Grand Cayman, B.W.I.

OR CALL **800-DIV-XPRT**, See & Sea Travel Service, 680 Beach Street/Suite 340, San Francisco, CA 94109.



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Come dive and enjoy the Keys at its best.

from $152.50



Stay three nights at the famous Chesapeake Resort, dive Alligator Reef, Coral Gardens or the "Cannabis Cruiser", with Buddy's "Scuba Safari" or the "Free 'N' Clear". Relax and enjoy the Florida Keys at its best.
4/21/86 to 9/6/86 $177.50
9/7/86 to 12/19/86 $152.50
12/20/86 to 4/20/87 $189.50
Per Person, double occupancy.

Enjoy the Chesapeake's 6 acres of oceanfront property with its freshwater pool, large saltwater lagoon and sunning beach. Experience the abundant variety of local seafood and night life within convenient distance.

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This Dive/Vacation Package includes: 3 nights accommodations, 6 dives per person, tanks, back pack & air, weight belt.

Chesapeake of Whale Harbor MOTEL & VILLAS RESORT
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BONAIRE SCUBA CENTER

(Continued from Page 79)

If you rent a car at the hotel you can drive to any of several dozen other popular dive sites. An alternative is truck diving, a very popular shop specialty. Since reefs and the wreck of the *Hilma Hooker* are very close to shore, it is often faster to get there by land rather than boat. Along the way, scenic routes are taken with stops made at lush spots such as Karpata. After the diving, there is often a tour to the small village of Rincon, with a stop at the "famous" Amstel bar for a drink. The trip usually leaves the hotel about 1:30 pm and returns by 6:00. A fun excursion, many divers, although considering the trip a bit weird beforehand, return for repeat performances.

Bonaire Beach Hotel and the Bonaire Scuba Center have arranged a number of attractively priced vacations including several special honeymoon packages. The Scuba Honeymoon, Learn to Dive Honeymoon, Snorkel Honeymoon and Non-divers' Honeymoon all include a champagne picnic on a deserted island. The couple is taken privately to Klein Bonaire, supplied with food, some bubbly and a beach blanket, then left alone for the afternoon. On another evening they are treated to a moonlight cruise on the *Lady Joma*.

Traditional packages, such as the eight day/seven night, include a divers' meal plan. Instead of restricting you to all meals at the hotel, the price includes breakfast daily and seven other meals that can be either lunch or dinner. You are then free to try any of the other fine restaurants in town at your leisure.

For dive vacationers, Bonaire rates as one of the best destinations in the Caribbean. A hotel brochure and complete package information is available by calling the Bonaire Scuba Center office, (800) 526-2370. In New Jersey call (201) 566-8866. Or write Bonaire Scuba Center, P.O. Box 775, Morgan, New Jersey 08879.

COCO VIEW RESORT MOVES OFFICE

The U.S. office for CoCo View Resort, Roatan, Honduras Bay Islands, has moved to a new, larger facility in San Antonio, Florida. New services offered include tours of the ruins of Copan; the botanical gardens at Lancetilla; and bass fishing at Lake Yojoa. Inquiries from travel agents and dive shops are welcomed.

For reservations and information, the new number to call in Florida is (904) 588-4131. Nationwide, call (800) 282-8932. The new mailing address is CoCo View Resort, P.O. Box 877, San Antonio, Florida 34266-0877.

SAWFISH SEEN

A dive on the Cannabis Cruiser (a sunken trawler once used for smuggling marijuana, southwest of Alligator Reef in Islamorada) always produces an abundant array and variety of marine inhabitants. Lately, divers have seen from one to three sawfish at this site. These animals range in length from 8 to 15 feet. They are seen hovering on the bottom alongside the wreck. They have proven to be excellent photo subjects, moving away only if a diver gets too close.

Dives to the Cannabis Cruiser are regularly scheduled by Buddy's Dive Shop at Bud 'N Mary's Marina in Islamorada, Florida Keys. For further information call or write Buddy's Dive Shop, P.O. Box 409, Islamorada, Florida 33036; (305) 664-4707.

LADY CYANA II

Lady Cayana Divers of Islamorada, Florida Keys, has added a new dive boat, the 60 foot *Lady Cyana II*. It complements the 40 foot *Lady Cyana*, which has served as the primary dive boat since 1982. Although the *Lady Cyana II* is Coast Guard approved for 49 passengers, charters are limited to a maximum of 35 divers to afford added comforts to each individual. Aboard the *Lady Cyana*, Coast Guard licensed for 27 passengers, charters are limited to 22 divers.

Lady Cyana Divers offers two dive trips daily. Each trip is a two tank dive.

For further information, reservations and your free dive site directory, contact Lady Cyana Divers, Mile Marker 85.9, P.O. Box 1157, Islamorada, FL 33036; (305) 664-8717.

DON STEWART HONORED

Cap'n Don Stewart of Bonaire's Habitat in the Netherlands Antilles has been awarded the 1985 John Stoneman Marine Environmental Award by the Foundation for Ocean Research. The Canadian-based foundation cited Stewart "for his outstanding contribution to the better understanding and appreciation of the marine environment." Stewart was also given the 1984 Boston Sea Rovers Walter Feinberg Memorial Diver of the Year Award. The Sea Rovers honored Stewart as "Caribbean pioneer and caretaker of the reefs, for his outstanding service to protect the environment."

MDEA INSURANCE

The Multinational Diving Educators Association has secured the most flexible dive store insurance program available today. The policy is custom designed for each individual store, enabling it to buy only the coverage needed. MDEA will offer this insurance program to members of all certification agencies.

For further information contact: MDEA, P.O. Box 3433, Marathon Shores, FL 33052; (305) 743-6188.

BONAIRE SCUBA CENTER

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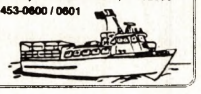
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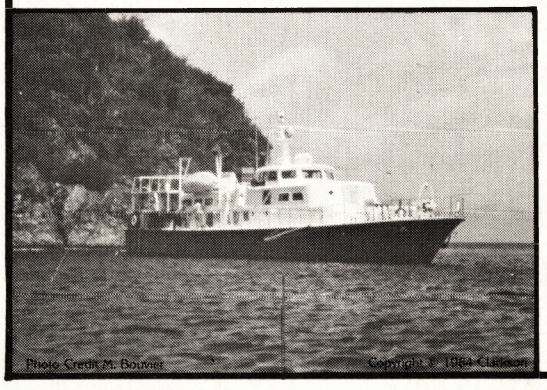
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The whole diving world thrilled to the recent treasure find of the *Atocha* by Mel Fisher and his team. On July 20, 1985 Mel Fisher's crew ended a 16 year search for this 17th century wreck in the tropical waters off Key West, Florida. They found the Spanish galleon, reported to carry 600 pounds of gold and 47 tons of silver. The estimated value of the treasure is $400 million.

The wreck and its valuable contents were strewn over a wide area by hurricanes. Thus, it is estimated it will take three years for divers and archaeologists to find all of the treasure and artifacts it contained. Every day the divers are making exciting finds. Recently, a 70 carat emerald was found. The gold bars and tons of silver already recovered are on display in Mel's Treasure Museum.

For the first time, under exclusive contract with Sea International, sport divers will be able to dive the *Atocha* site and observe the ongoing salvage of treasure and archaeological work. A four day weekend program has been put together that will involve lectures by Mel and his staff, a dive on the *Atocha* site, plus two other dives in the beautiful waters off Key West, a behind-the-scenes look at the museum and also a visit to the preservation laboratories where the treasures and artifacts are now being cleaned and preserved. The participants will stay in Key West's Ocean Key House. A cocktail party with Mel's divers and transportation are all part of the arrangements.

These programs will be held every weekend, April 1 through September 15, and are designed to accommodate 80 divers per weekend. For information and reservations contact Sea International, 1732 Erie Blvd. East, Syracuse, NY 13210; (800) SEA-DIVE.

BOTTOM TIME II

A new high speed catamaran, *Bottom Time II*, is under construction in Ft. Lauderdale, Florida. Its agent, Bottom Time Adventures, will be scheduling trips starting in May.

Bottom Time II's catamaran design will offer a stable ride. Measuring 80 x 30 feet, it will have 5,000 square feet of passenger space above the main deck. This allows the *Bottom Time II* to offer: two person cabins with lots of storage; a wash basin; seven showers; six toilets; a giant main saloon; full size single and double beds; E-6 film lab and camera repair area; two large sundecks; individual gear lockers; spacious suitup area; two, eight by five foot dive platforms at water level and three water entry stations.

Bottom Time Adventures specializes in live-aboard dive travel throughout the Ba-

hamas. The cruising schedule for the upcoming season will include the Exuma Cays, Nassau, Berry Islands, Eleuthera, Grand Bahama Island, Bimini, the Victory Cays and the Dry Tortugas.

For bookings or more information contact: Bottom Time Adventures, P.O. Box 11919, Ft. Lauderdale, FL 33339-1919; (305) 561-0111.

CLUB FREEDOM

Freedom Marine Ltd. has created Club Freedom, the first private club uniquely designed for the international diving community. Members own a dive ship, *C Freedom*. She is a 136 foot sister ship to the famous *Calypso*, being refurbished to exacting standards, renovated into a floating hotel.

Club Freedom's members will chart the course of their private ship by deciding which sites they want to experience. For one week, each year, members and the guest of their choice will use *C Freedom* as their base of operations. Once they arrive at the nearest airport, they will be taken immediately to the ship's site by helicopter or limousine. On board, as well as new double staterooms, members will find everything they need: PADI and NAUI certified divemasters, compressors, cameras, film processors and much more.

Club Freedom will provide equipment for all aquatic sports, including parasailing, windsurfing and fishing. Gourmet chefs and staff will be on hand to cater to members and their guests, for everything from a special meal, to a tour of a deserted beach or romantic port of call.

A limited number of memberships are now available. The price of a ten year membership includes a guest of your choice. For complete information, contact: David Von Holtum, (800) 663-0330, (604) 688-3404.

CAYMAN TANK SAFETY

The Water Sports Association of Grand Cayman Island recently sponsored the NAUI-PSI Visual Cylinder Inspection (VCI) training course for 19 resort staff members. Bringing the entire program onto the island so all dive facilities had access shows a concern by the Cayman diving community for the safety of off-island visitors, reported PSI Instructor, Bill High. "This was the first PSI-VCI training offered outside the U.S. Its success on Cayman ensures other international courses will be scheduled," he said.

PSI-VCI courses are regularly scheduled throughout major cities in the U.S. and upon demand in other countries. Resorts unable to host a local course should encourage their service staff to attend nearby courses.

The most current schedule of NAUI-PSI (Professional Scuba Inspectors) VCI courses can be obtained by writing to: PSI, 6531 NE 198 St., Seattle, WA 98155.

DIVE Anthony's Key Resort

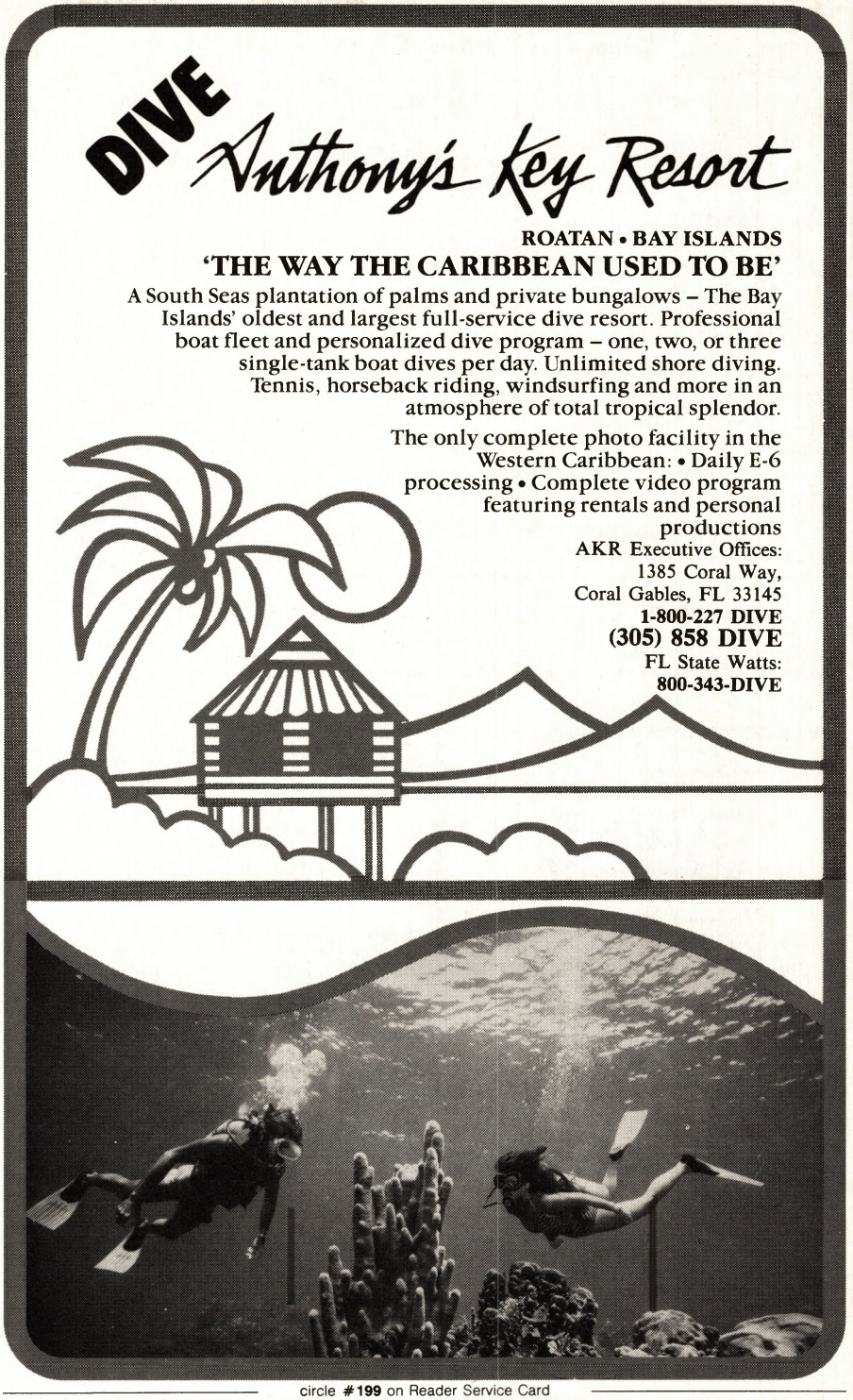
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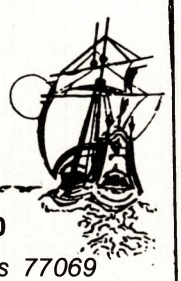
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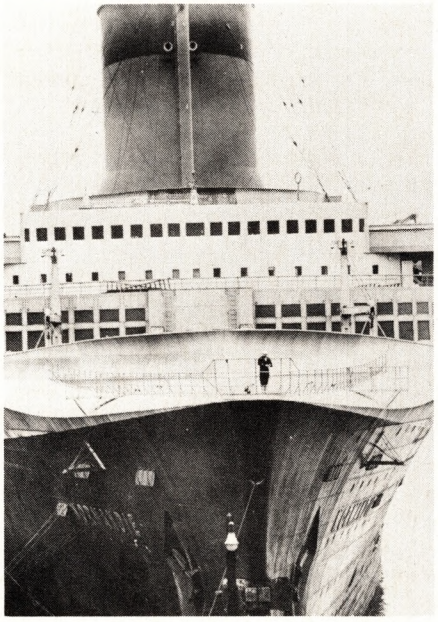
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SALVAGING THE NORMANDIE

BY CHARLES IRA SACHS

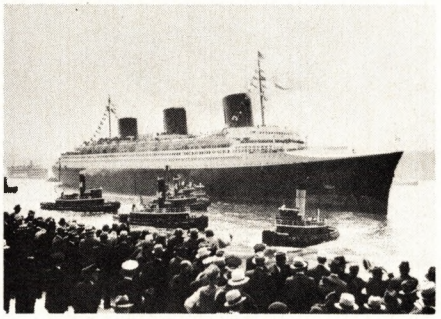
It was June 3, 1935—just more than 50 years ago—and 100,000 watched her arrive in New York. The first ocean liner more than 1,000 feet long was arriving on her maiden voyage from France. No one that day could have dreamed of her future glory as one of the world's most beautiful and glamorous ships.

The *Normandie* was first the dream of Vladimir Yourkevitch, an assembly-line worker at a Paris Renault factory. Yourkevitch—who was originally Russian, not French—was an engineer at the Russian naval shipyard at St. Petersburg before the revolution. He was responsible for designing a unique hull that was to become a feature of the fastest and most efficient battle cruisers in use by the Russian Navy. After fleeing Russia, he wasn't a noted naval engineer anymore, but a lowly factory worker. Thus, he had trouble convincing the Compaignie Generale Transatlantique (CGT or French Line) that his design should be used for a new express liner. But, after extensive hull tests, the company decided that Yourkevitch's fat-centered hull with a bulbous bow and pointed ends was a winner.

The *Normandie*, christened by Madame Labrun, wife of the French president, slid down her launching ways on the overcast afternoon of October 29, 1932. More than 200,000 people came from all over France to see the great ship. With champagne broken nicely on her bow, the 27,657 ton hull made her first voyage: 75 seconds from the land to the sea. When she hit the water, unexpectedly powerful backwash swept 100 people into the water.

Slowly, with painstaking care, she became a ship both inside and out. The *Normandie* was 1,029 feet long, with a beam of 119 feet. At 79,280 tons, with turbo-electric engines of 160,000 hp, her flared bow, counter stern and superstructure topped by three giant-bottomed, black-topped funnels, she proved a perfect maritime balance. Just above her boat deck, midship, her name stood in giant letters, lighted at night.

The *Normandie's* interiors and furnishings were designed by the greatest



Tugs escort the liner *Normandie* into port.

French Art Deco artisans: Dominique, Montagnac, Daurat, Dupas, Lalique and Subes were but a few. Their work would make the *Normandie* a landmark in maritime history. They would design huge public rooms—mainly in first class—that showed their skills with bronze, hammered glass, crystal, lacquer, weaving and other decorative arts.

The large open spaces in the Smoking Room, Main Lounge and Gallery Hall



The 300 foot long Grande Dining Salon.

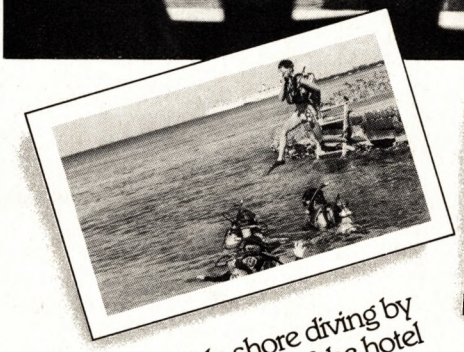
were made possible by an innovation: Boiler exhaust, instead of going up through the ship's center, went up through smaller ducts on each side. This way, no large exhaust ducts had to be hidden in the center of large public rooms. Above the public rooms, the smaller ducts merged and led to the forward two funnels. While the ship had a third funnel, it was a dummy. In fact, it housed the dog kennel.

Topping all the first class public rooms was the Grande Dining Salon. This room was 300 feet long, 46 feet wide and three decks high. It could seat 1,050 first class passengers at a time and was the largest room in any liner ever.

However, the *Normandie's* 1935—1939 career wasn't always a smooth one. Initially, her propellers proved to be a faulty design. Their three blades caused excessive vibration—so much so

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NORMANDIE

that water glasses had to be filled only halfway, lest water splash from them. In third class, latched cabin doors shook so loudly it was often said they sounded like machine guns.

The vibration was corrected with a new set of propellers—with four blades—and extra internal structural support. At least the *Normandie* ran smoother than her rival at Cunard, the *Queen Mary*, which also vibrated at high speed.

Normandie didn't keep her Blue Ribband (for speed records) four years between 1935 and 1939. The *Queen Mary*,



The *Normandie*'s smoke over New York.

after entering service in 1936, proved to be faster, with much more horsepower. Still, the ships exchanged the Blue Ribband several times before the war.

At the end of August 1939, the *Normandie* headed for America on her 139th voyage. It would be her last. On her final crossing she had 1,417 passengers on board, including Jimmy Stewart. Everyone expected European hostilities to break out at any moment and everyone was relieved when she reached New York safely on August 28.

She was scheduled to leave for France at 10:00 am on August 30. At first, the time was delayed until later in the day. Then, a decision was made that she would wait awhile in New York. As it turned out, she never sailed again.

The *Normandie* remained at Pier 88. She stayed there, watched over by 500 crew members, until the time was right for another sailing. Instead, the European situation went from bad to worse, with France finally being occupied. The French Line didn't want the *Normandie* operated with swastikas on her, so the ship was kept in New York. In effect, she was a prisoner of war. That is, until December 7, 1941. On that day, the United States looked with envy on her.

On December 12, armed Coast Guard men boarded the *Normandie* and took possession of her in the name of the United States government. She was to have a new job.

First she received a new name, *Lafayette*, for the great French leader who helped the United States in its revolution.

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But the question remained: What would she be? There were two options. First, her upper decks could be cleared and she could serve as the largest aircraft carrier in the world. Second, she could carry 18,000 troops at a time.

After much consideration, troopship won out and the conversions began. Since no drydock was large enough to hold her, it was decided she'd be converted at her pier. First, all the Art Deco interiors had to be stripped out. All the glass panels would go from the Grand Salon, all the Lalique crystal from her Dining Salon. Everything fancy would go, except for the deluxe suites aft on her top deck. They would be used by military officers on transatlantic crossings.



photos/courtesy ONRS, Inc.

The *Normandie* swamped at dockside.

Her three lower decks of portholes needed steel plates welded over them. On her upper decks, 14 50mm anti-aircraft guns were installed on newly added platforms. Inside and out, the ship took on a new form for its wartime duties.

Then, unexpected problems arose. For one thing, as a French ship it naturally had French fire fighting equipment. Unfortunately, this didn't match with American equipment so major changes were called for. Even her fire hoses had to be replaced with larger American hoses. Through all the work, a fire watch was always on duty in case anything happened.

On February 9, 1942, something happened. By then, all the artworks were gone from the ship. She had been stripped. But in the Main Lounge her light stanchions, once functional but now superfluous, were being cut down. Nearby were thousands of lifejackets in temporary storage.

As a welder was making the last cut on the last lighting structure, a spark jumped from his torch and hit a pile of lifejackets. They burst into flames. It was approximately 2:37 pm.

The fire spread quickly. The fire watch for that room was on lunch break. The room's fire hoses didn't work because they hadn't yet been converted. Quickly the fire jumped from one pile of lifejackets to another, and then another, like dry, burning grass.

In the remaining hours of that afternoon, hundreds of firemen and a dozen lifeboats fought a fire that they were sure

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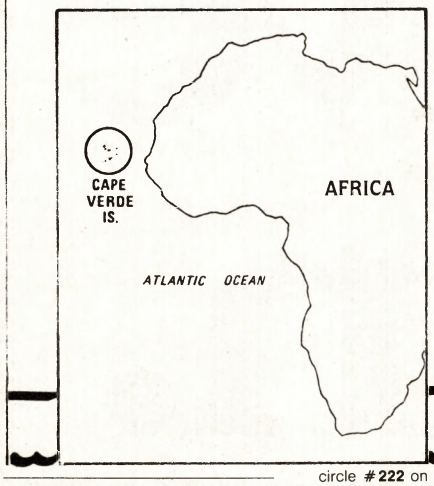
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was destroying the great liner. In fact, the fire remained on her upper decks, causing relatively minor damage. Unfortunately, the firemen's solution was worse than the problem it was meant to solve. They poured at least 10,000 tons of water into the ship, causing a severe list to port. About 12 hours after the fire began, the *Lafayette* rolled over on her side.

Inside, the *Normandie* was a mess. Debris was everywhere. Because of the unusual angles, passageways became crawl spaces and elevators became passageways. Everything was mixed up. However, her hull was sound, with no damage from the fire or her rollover.

The ship lay in a bed of soupy mud.



photo/courtesy Leonard Greenstone

Leonard Greenstone in dive gear, age 20.

Her bulbous bow was out of the water, her starboard props motionless in the air. Her port side, settled into the mud, was engulfed in sewage.

More than 500 civilian workers were engaged in the salvage, with half working inside the hull. In charge was Navy Commander William A. Sullivan.

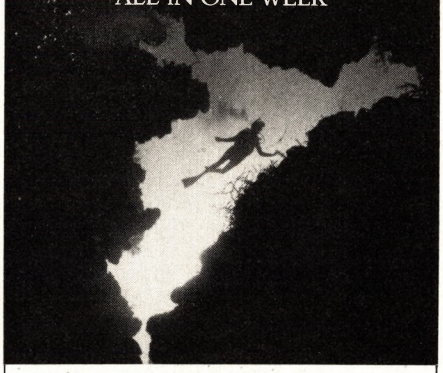
When the *Normandie* capsized, more than 350 portholes and 16 large cargo ports were either left open or forced open by the pressure. These would have to be sealed by divers working in zero visibility caused by sewage, oil and gas in the water. And, there weren't enough divers to do the job. As a result, the wreck—a perfect opportunity for training—became a diving school.

Actually, three schools were set up. There was a diving school for enlisted men, a diving school for civilians and a salvage school for Navy officers. Thanks to the schools, it was possible to have 75 divers working at one time. As they became more proficient, they would be allowed to go on to more difficult jobs. Of those that attended the schools, about one-third didn't graduate owing to lack of mechanical skills, stamina or emotional problems that kept them from functioning at maximum efficiency.

With all the wreckage, there was a constant chance that hardhat divers would have their suits punctured or their hoses would get caught in the debris. Fire was a hazard because of floating gas and oil.

Slowly, 6,000 tons of rubble was taken

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from the ship, including 4,000 tons of smashed glass.

To plug the portholes, a newly designed "Tooker Patch" was used. It was a piece of wood, three inches thick, cut in the shape of a porthole, with a rubber gasket on the inside edge about one-quarter inch thick. The patch was cut, edge to edge, with a barn-door hinge with four long toggle bolts, two to a side, to hold it together.

A diver, heavily weighted down, would drop to the side of the ship. He would enter it, in total darkness, and feel his way from memory (they first trained on models of the ship) to the correct porthole. Inside, there were tender stations where a diver could rest. Sometimes it would take an entire week to seal a single porthole. A total of 356 were eventually closed.

Besides the portholes, there were 4,500 other holes that had to be filled. The largest plug was 54 feet long, 22 feet wide and 3 feet thick. It weighed 52 tons and covered a large cargo port.

Small patches were wedged into cracks like corks in a bottle and everything had to be bolted down or fastened with concrete. And, sealing the hull wasn't all. Inside, bulkheads had to be sealed and reinforced. She had to be subdivided into many watertight compartments for the controlled pumping, otherwise she could roll over and the water could shift from port to starboard.

Using grooved, 8 x 12 inch timbers, joined by 2 x 4 inch timbers, divers made bulkheads out of walls and decks became floors and roofs, in the changed *Normandie* interior. Concrete was used to seal the compartments. In all, 240,500 board feet of 8 x 12 timbers and 1,685 tons of concrete were used in the bulkhead work alone. But, much more had to be done.

The ship's decks had to be shored up to withstand the enormous hydrostatic pressures caused from controlled pumping. A mile and one-half of timber was installed for this purpose, all in darkness with divers doing the job by touch alone.

During this period, other divers did their best to rustproof the *Normandie*. They cleaned everything and then put on a preservative and a rust-preventing compound. Nothing could save the electrical wiring, however, so no efforts were made toward doing so; the wiring would have to be replaced later.

On October 13, 1942, the press toured the ship and saw all the work that had been done to prepare her for raising. They walked through the now clear interiors and were amazed at what had been accomplished. Pumping was getting closer, however slowly. For that, 98 pumps had to be installed. They weighed between 1,000 and 2,760 pounds and were lifted by derricks into the ship and mounted on hinged platforms so that, as the ship would rise, the pumps could be leveled. In all, they could pump 10,000 tons of water an hour from the sunken lin-

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NORMANDIE

LEONARD GREENSTONE

Leonard Greenstone worked as a salvage diver on the *Normandie* in 1943 and 1944. He was 20 years old at the time and joined the New York operation after helping clear the ships sunk and damaged at Pearl Harbor. The waters in the Pacific Ocean were clear compared to the New York Harbor.

"When I look back at working on the salvage of the *Normandie* I really am shocked. I would never do *anything* like that today. When you're young you don't realize the danger or the working conditions. It was a terrible job. But for a youngster it was exciting."

Greenstone became an expert salvage diver while working on *Normandie* and later became an instructor diver on the wreck site. After the ship was raised and towed away, he continued work at Pier 88, where the ship capsized, and helped clear the dock area of debris.

Leonard Greenstone continued his work in salvage and related diving. He is a reserve officer of the Emergency Services Detail of the Los Angeles County Sheriff's Department. As a member of the State Prison Board, he developed a diver training program for prisoners at Chino. The story is documented in the book *Prisoners of the Deep* by Brian David Andersen and Kevon Andersen.

The following is an excerpt of a letter, written to his parents by Greenstone during the *Normandie* salvage:

Dear Dad and Mom, I have graduated from Navy's School of Ships Salvage, better known as the Navy Elimination Program!

Dad, this was much different than the diving in Pearl Harbor and taught different—Please save this letter.

I came here to Pier 88 N.Y. with a group of 40 men with fleet and mechanical experience.

We came here to learn ship salvage, by diving on the sunken ship Normandie.

When the ship capsized and sank in 50 feet of water and 15-20 feet of mud, Merit, Chapman & Scott was hired to salvage here—they failed because of a lack of divers with construction experience, so the Navy took over and brought us in.

My first few weeks here were strictly to learn the physical aspects of diving.

Diving illnesses: 1. Carbon Dioxide poisoning—CO_2 excess caused by poor circulation. Resolved by surfacing diver. Remove his dress by cutting it off quickly, provide fresh air or oxygen and pray!!

2. Compression sickness: (Bends—Caisson) cause: nitrogen saturation—diving too deep—too long—surfacing too fast. This was demonstrated by placing a guinea pig in a chamber at 60 psi gauge pressure (135 ft. salt water). Then there was a 15 minute description of what was happening physiologically. Pressure was dumped—the little fellow was taken out—soon his rear legs became immobile. We were told this can happen to you if you come up too fast after being deep too long. He was thrown into a garbage can.

3. Air embolism: (lung blow out) cause: coming up too fast to allow expanding air

from being ventilated sufficiently. When upon ascent the diving dress (suit) becomes over inflated, you can't bend your arms or hit your chin button as your hat raises off your shoulders—result is a "blow up"—rapid, spread eagle ascent to the surface. If you don't exhale continuously, air embolism. We were shown a film of an embolized diver on the surface. The camera moved down on his faceplate covered with frothy blood. It really was scary!

4. Suit squeeze: cause: external sea pressure greatly exceeding air pressure in the diving dress. The collapsible material of the dress is forced up into the hardhat—like a cloth bag attached to an open bottom of a tomato can. The more pressure (push) put on the bag the further the bag is forced up into the can. Relating this can and bag to a diver's dress and hat—the dress moves up into the hat taking the diver's body with it—crushing it like a cracker in a giant's hand.

We were shown a picture of a diver who had slipped from the keel of a capsized vessel to the bottom—15 ft. to 70 ft. His control valve jammed with ice (air pressure released causes icing). When he was brought to the surface just three feet of his dress and shoes were hanging from his hat. The rest of the diver was in his hat.

After a few weeks of this kind of teaching the class was told: "Tomorrow everyone gets wet."

The elimination began. When we were awakened to make our first dive, the guys claimed colds, earaches, cramps, etc. The elimination continued and claustrophobia took some.

Our second dive was that night and the elimination grew.

I dove first not to be influenced by other's problems. Some guys refused to leave the ladder in the water and the instructor stepped on their hands to force them down—the divers made loud comments about the diving officers being the sons of female dogs and additional elimination took place.

Dad, whether it is night or day the water in the Hudson River is always the same "black," and the stuff we had to bury ourselves in on the bottom called mud (15-20 feet deep) was not mud, it was sewage from the cities upstream and we worked in this stuff over our heads and the tools or materials we used when dropped didn't sink very far—we could reach out and find them hanging in the stuff

The Normandie *is getting ready to be towed to Elizabeth, New Jersey and only 18 guys are left from our starting class of 40. The things I have learned and the teaching methods have been a great experience I will never forget.*

I will be kept here for awhile as an instructor and I am going to try to change some of the procedures.

The Navy has set ideas and I am sure it's not going to be easy to change much, but time will tell—someday maybe?

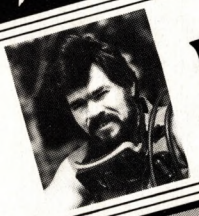
This has been a new, strange and exciting experience. I am well, miss and love you both.

Your son,
Len

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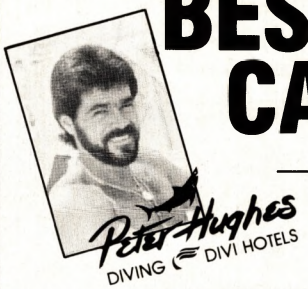
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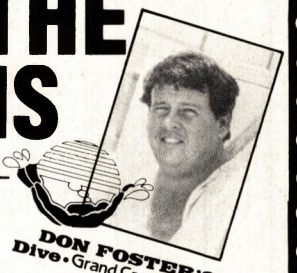
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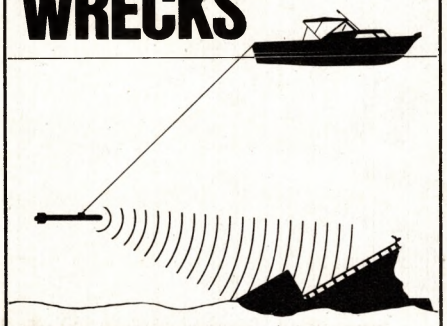
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NORMANDIE

er. At that rate, she could be dry in less than 10 hours. However, that rate wouldn't be possible. The ship would have to be raised slowly, so she would not snap back and crash into the pier.

On August 3, 1943, the pumps were tested. The ship appeared to be all tight. To prevent the hull from being held to the mud bottom by suction, a tunnel was made under it using water and air jets.

The next day, August 4, the water was lowered in the hull by nine feet and the ship showed that she was trying to right herself. From then on, until September 15, the *Normandie* was slowly raised.

On October 27, Navy Day, the *Normandie* was turned over to Captain H.V. McKittrick of the New York Navy Yard at Brooklyn. It had been 20 months and 18 days since she caught fire, but she was at last on an even keel again. Fire scarred, stained by oil, her superstructure gone, her rebirth was at hand.

On November 3, 1943, the *Normandie* was towed from the pier to a drydock at the Navy Yard Annex east of Bayonne, New Jersey. There, the Navy made some

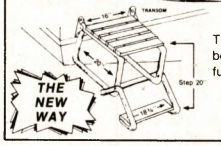
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startling discoveries. She had substantially more hull damage than had been thought, and, even worse, her engines were ruined. This would mean diverting important men, equipment and money from other projects, from other ships that could, probably, be completed at less cost and fuss. It was estimated it would take 18 months to refit the *Normandie*, at a cost of $50 million. This was deemed unacceptable. In late 1943, the Navy decided it wouldn't spend anything more on the ship.

In the remaining months of the war, studies were made concerning what could be done with the *Normandie*. With the war nearly over, the ship gradually became a forgotten item on some forgotten government registry. Finally, on September 20, 1945, President Truman declared the *Normandie* to be surplus property. The French government had no interest in buying her, and, in fact, the French insisted that the United States pay France for the vessel. The U.S. Agreed to pay $13.5 million.

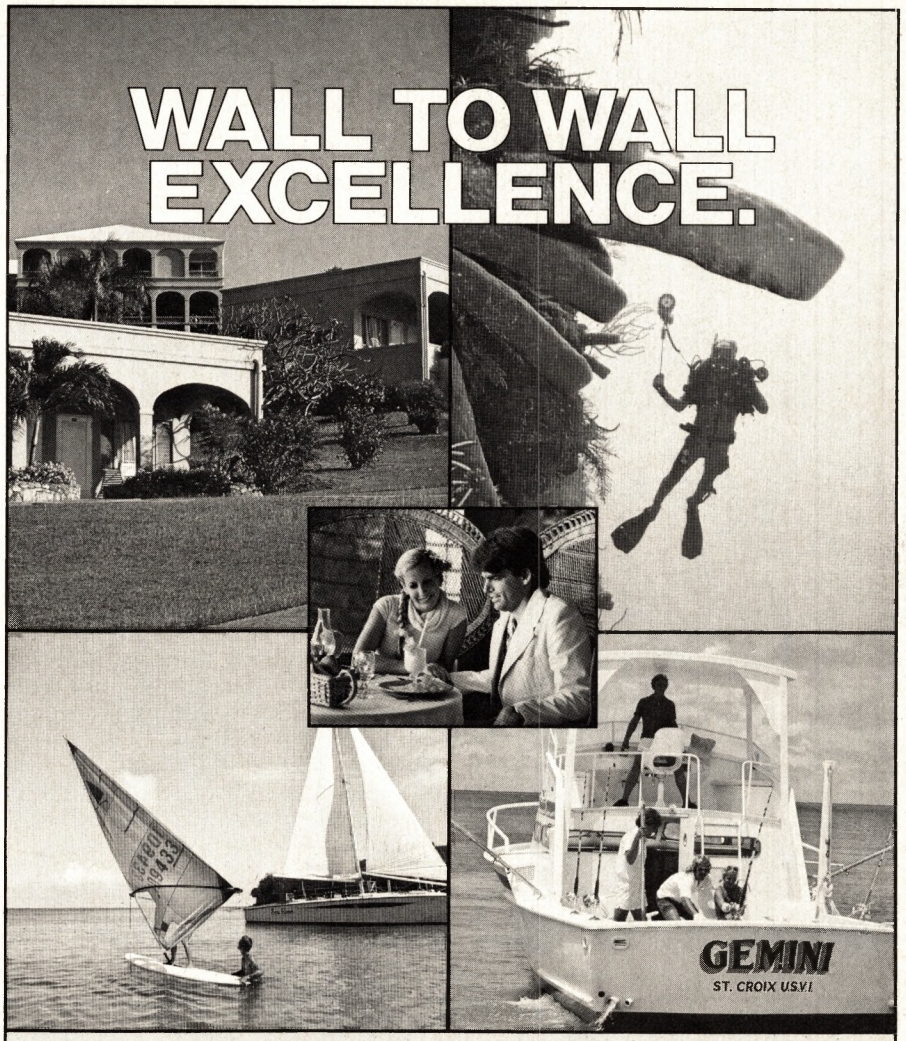
September, 1946, saw the *Normandie* officially put up for sale by the United States government. A junk firm, Lipsett, Inc., got the winning bid: $161,680. The *Normandie* was sold as scrap metal.

Despite all the wasted time, effort, and money spent on raising what would eventually be sold as junk, a great deal of value was gained in raising the *Normandie*. The salvage schools operated during her recovery trained almost 2,500 men who would become the backbone of the Navy Salvage Service. On the East Coast of the United States alone, these men would soon rescue ships and cargo valued at $750 million and, worldwide, they would soon clear more than 50 harbors, removing the wrecks of more than 1,000 ships. Their work in salvaged and reclaimed ships and material has accounted for over $2 billion. These gains have more than justified the salvage of the *Normandie*.

Today, the *Normandie* is not totally gone. Many of her interiors, stored during the war, were used in the post-war French Line ships *Liberté* and *Ile de France*. Later these relics would be sold when these ships finally joined the scrapyards too.

Some of the *Normandie*'s panels from the Main Lounge, done by Jean Dupas, are now in the Metropolitan Museum of Art in New York. Recently, Malcolm S. Forbes bought a set of eight panels for $90,000. They have become part of the new Forbes Museum in the Forbes Building in New York.

Other relics appear in collections throughout the world, both large and small. China and silverware are sometimes found at flea markets; paper collectibles are much in demand and are becoming valuable. If one is lucky, he might find a life ring, taken from the ship by a collector/worker during the salvage operations.



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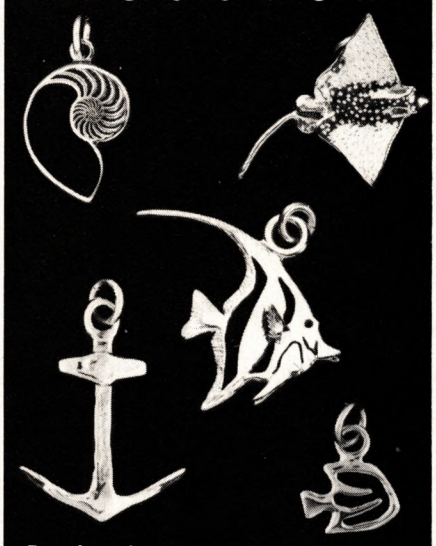
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NIKONOS SHOOTOUT

(Continued from Page 36)

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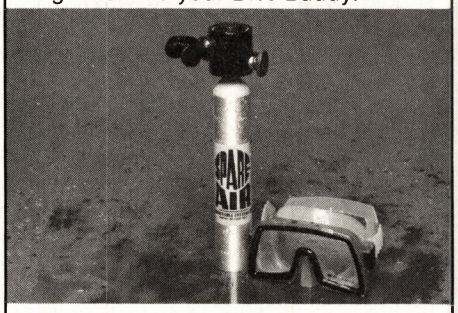
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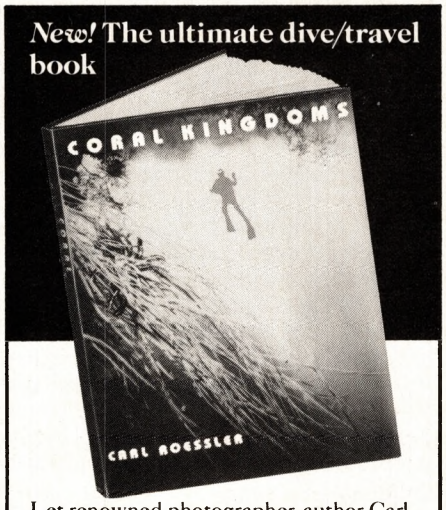
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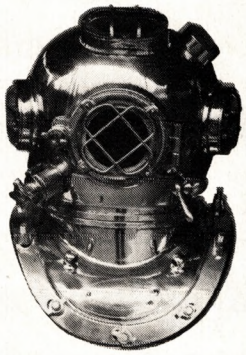
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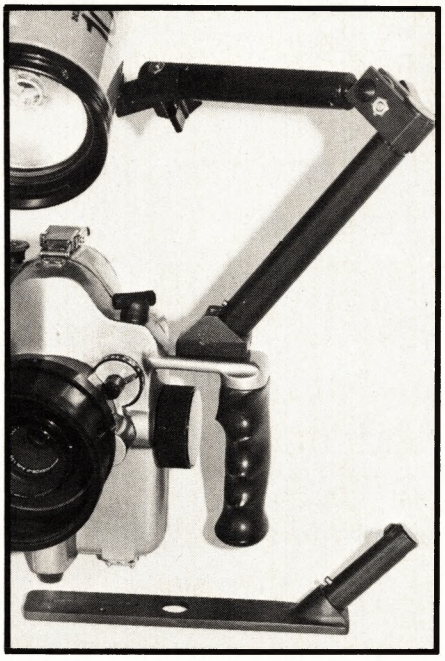
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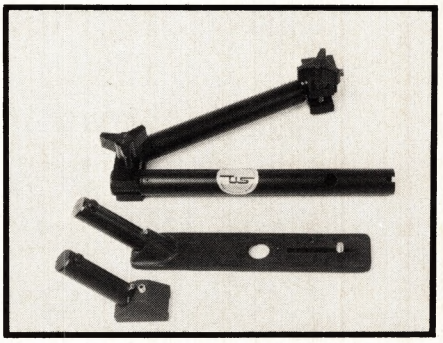
TEXT AND PHOTOGRAPHY BY GERI MURPHY

Tussey Underwater Systems, maker of the Pro-line F3 aluminum U/W camera housings, has introduced a revolutionary flash arm. The Tus-Arm allows the user to fit any strobe to any underwater camera. This easy-to-operate device adds a completely new dimension to flash arm flexibility.

The basic design consists of a two part tubular arm with a locking articulated joint in the middle. The base of the arm is fitted with a quick disconnect tubular slide that fits onto various bases. The top end of the arm features a tilting, rotating ball mount for the strobe head. Each arm comes with a head designed to fit the strobe of your choice, including Subsea, Oceanic, Sonic Research, Ikelite or Nikonos.

The entire Tus-Arm is constructed from finely machined aluminum parts and stainless steel screws and springs. The tension bars on the clamps are double thickness and look as if they will last a lifetime. Each part is anodized for protection against saltwater corrosion.





The Tus-Arm is made of machined aluminum. Springs and screws are stainless steel.

The major feature of the Tus-Arm is a simple, but highly effective stud mount and locking button at the arm's base that allows a quick disconnect.

A secondary feature is that each Tus-Arm is shipped with one of two different base mounts: one that fits on a universal shoe mount or one that functions as a tray for Nikonos cameras.

The arm can be ordered in 15, 18 and 23 inch lengths.

The Tus-Arm's specially designed articulated joints will support the weight of the strobe out of the water as well as underwater. The arm is compatible with just about any Nikonos or housing.

The cost of a Tus-Arm (excluding the base mount) runs from $120 to $137.50, depending on flash arm length. The standard base mount for a universal shoe is $35.50. The Nikonos tray with integral base mount is $44.50. For more information, contact: Underwater Kinetics, 1020 Linda Vista Dr., San Marcos, CA 92069; (619) 744-7560.

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Tabata's Snorkeling Kit

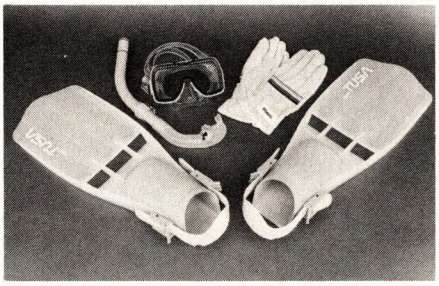
Ultra Feminine Looking . . . And It Fits, Too!

TEXT AND PHOTOGRAPHY BY BONNIE J. CARDONE

It is hard to look at a piece of dive gear and have the words "extremely feminine" pop into mind. That's exactly what happens, however, when you look at some of the equipment Tabata is selling. Although Miami Vice has popularized colorful fashions for men, Tabata gear in hot pink, in smaller sizes, was obviously designed with women in mind.

Among the equipment intended to catch the feminine eye is the Tabata snorkeling kit. It consists of mask, snorkel, fins and gloves, all nicely color coordinated in either pink, blue, yellow, lavender (new for '86) or even basic black.

The fins are Mini-TUSAs, scaled down versions of the TUSA, for smaller divers.



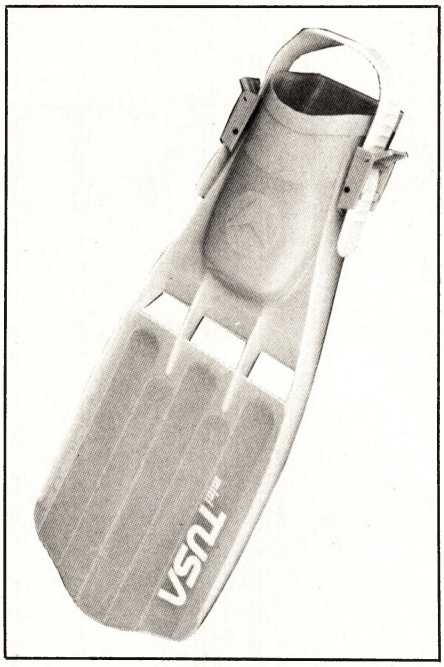
These are vented fins, with a clear, polyethylene blade that is impervious to ozone and ultraviolet rays. The foot pocket is a soft, comfortable plastic. A one-touch buckle allows you to adjust the strap quickly and easily. The Mini-TUSAs are very light weight, but the snappy, vented blades provide plenty of power. These are popular with underwater models because they are so photogenic. The Mini-TUSA fins sell for $60.

The mask is a Mini-TUSA as well. The frame has a dramatic black liner and the faceplate is one piece of tempered glass. It's a low volume mask that should fit a variety of faces. The hypoallergenic crystal silicone skirt has a double seal and is soft and comfortable. Because it is silicone it will last practically forever. Because it is clear it lets light in, reducing tunnel vision and making the wearer's face photogenic. Of special note is the strap buckle: It allows you to adjust the split head strap quickly and easily even while you're wearing the mask. The Mini-TUSA mask sells for $55.

The TUSA snorkel complements the Mini-TUSA mask. It has a color-matched contoured barrel and a crystal silicone mouthpiece that swivels for custom posi-

tioning. This snorkel has a special purge valve that allows water to drain when the tip breaks the surface of the water. Thus, clearing it is a breeze; just a puff of air does the trick. The TUSA snorkel comes with a plastic/silicone keeper that's unique: It doesn't have to be wrestled up and down the barrel; it slides up and down much easier than conventional keepers. The mask strap slips into split guides on one side. The TUSA snorkel(SP-160Q) sells for $26.

The last, but not the least, member of the snorkeling kit is the pair of Gripper gloves. These have double material on the palms and fingers for durability. The Velcro® wrist adjustment allows you to





make the gloves as tight as you desire. This is a feature that will be most appreciated when you're snorkeling in water that has tiny, stinging organisms in it: Wear the gloves with the cuffs overlapping your wetsuit top and tighten the Velcro—nothing will be able to make contact with your bare skin. These gloves sell for $17.

Tabata's snorkeling kit—in hot pink—was designed for women and children. However, since it comes in bright blue, lemon yellow, basic black and now, lovely lavender, it's also perfectly suitable for smaller male divers. See it at your Tabata dealer.

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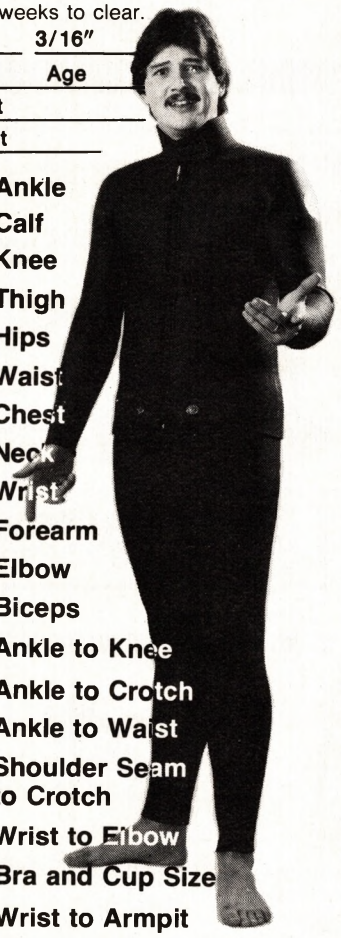
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PLANA AVANTI

A Revolutionary Model From A Top Fin Maker

TEXT AND PHOTOGRAPHY BY GERI MURPHY

A few years ago, AMF Mares of Italy rocked the U.S. diving market with a revolutionary diving fin called the Plana. Made of a new high-tech material, this fin was lightweight, snappy and fast. The Plana engulfed the American shores like a tidal wave. The original Plana spawned two other models, the Power Plana and the Plana Graphite. Now comes the Plana Avanti, another spectacular innovation from the house of Mares. And, it may be that the fourth Plana is just as revolutionary as the first. It is a totally new fin concept, with lots of bells and whistles.

Knowing a good thing when they see it, AMF Mares has retained the same basic material and construction that made the Plana such a hit in the first place. The entire fin (blade and foot pocket) is made of Tecralene. This material is light as a feather, extremely tough and will not tear or delaminate under heat, exposure to sun or saltwater immersion. Best of all, Tecralene holds its flexibility and snappiness after years of wear.

So what makes the Avanti revolutionary? It is a whole new concept in blade design called power channeling. The blade is actually three separate pieces of stiff Tecralene joined together by two channels of a softer, more flexible membrane. The center portion of the blade is a flat, wide surface that does all the pushing. The other two portions are the outside rib stiffeners, which provide strength and snap to the fin. The flexible membranes between the blade parts are U-shaped channels that can bend or spread with the amount of thrust being applied. This allows the entire mid-section of the fin blade to bellow outward and form a giant scoop. The increased blade area and scoop-like motion moves more water and creates greater thrust than other designs.



The Avanti foot pocket is contoured.

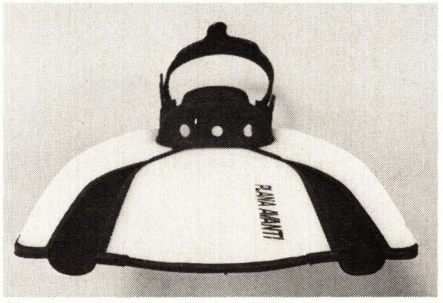
Because of the flexibility of the membrane channels, the scoop reverses itself and works both on the downward and upward fin strokes. Also, the depth and size of the scoop is directly related to the leg thrust applied. A really strong kick will amplify the blade thrust, while a light kick will move you through the water at moderate speed and with minimal energy expended. In addition, the U-shape membrane channels provide much greater blade stability and reduce side slippage

caused by uneven kicking. Using these fins is like riding on rails.

AMF Mares didn't stop with just a revolutionary blade design. The foot pocket has been completely redesigned as well. The Avanti's new orthopedic foot pocket is deeper, longer and more contoured to the shape of a diver's foot. The upper portion of the pocket is sculpted in a comfortable contour that allows a diver to walk upright on a boat deck or beach.

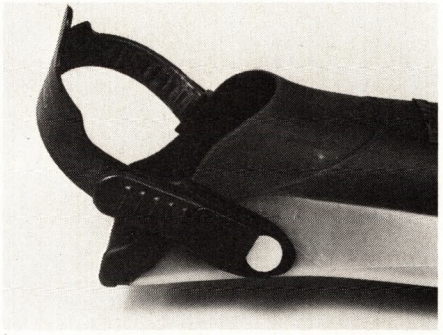
The Avanti is available in four sizes: small, medium, large and extra large. Each succeeding size has approximately a 10 percent larger fin blade.

Now for the bells and whistles: The Avanti fin features a revolutionary swivel heel strap. It allows the user to adjust the angle of the heel strap for a firm and solid fit. What a delight!



Flexible channels provide stability.

More good news; AMF Mares has come up with a newly designed heel strap buckle. It is a lever action, quick adjust cam device similar to those used on high quality professional dive masks. No more struggling with stubborn heel strap buckles! The new buckle is a rugged, non-corrodible thermoplastic. The strap rides easily on a roller bearing and the



The Avanti features a swivel heel strap.

cam lever ensures positive locking. Straps can be quickly adjusted both above or below the surface.

There is no question that AMF Mares has done it again. The Plana Avanti is truly revolutionary in both design and performance. If you liked the Power Plana or Plana Graphite, you are going to love the Avanti. For more information, see your local dive store dealer or contact SeaQuest, Inc., 2151-F Las Palmas Drive, Carlsbad, California 92008; (619) 438-1101.

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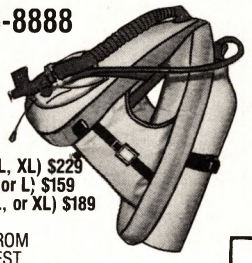
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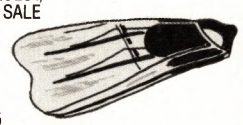


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YAMAHA 150

(Continued from Page 66)

tion the propeller and metal fittings are stainless steel.

During open water testing, uses for the hydraulically driven power trim and tilt controls became apparent. As we tried a range of cruising speeds, the angle of the engines relative to the boat and the water could be fine tuned to get the most power with the slowest engine speed. While heading into the swell at high speed, porpoising was reduced or eliminated with the aid of auxillary Bennett trim tabs at the base of the transom and proper trim of the engines. When the time came to load the boat back onto its trailer, a touch of one button tilted both engines safely out of the water.

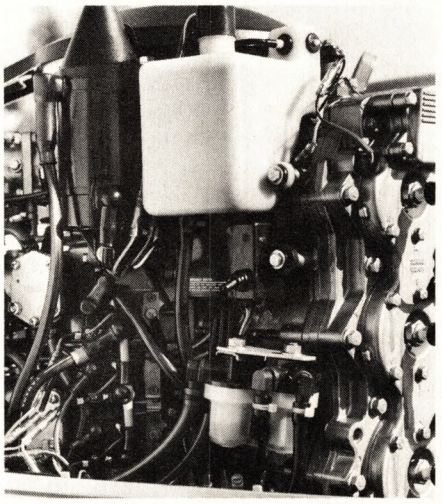


The dual throttle control for the twin 150s can be operated with one hand. One button on the handle (under thumb) trims both engines up or down simultaneously.

Basic instrumentation is limited to a tachometer with lights indicating the status of the lubricating oil supply. Accessory gauges to indicate speed, water temperature, water pressure, fuel level, voltage and hours of operation are also available. In the kelp beds we found the water pressure gauge to be particularly useful for keeping track of kelp, which can plug the water intake.

All Yamaha outboard motors come with a two year limited warranty. Authorized service stations are well supported by factory representatives as close as the phone. The only difficulty an owner might have is finding a Yamaha service station within easy driving distance.

Performance of the dual counter-rotating Yamaha 150 engine system is quite impressive based on speed, ease of operation, quietness and mechanics. The added maneuverability of twin propellers when making sharp turns and during docking is unchallenged. On the other hand, the base price of $15,215 will certainly cause some raised eyebrows and long whistles when the alternative is an equivalent inboard motor. (The price includes virtually everything needed to rig the dual motor system.) The choice is not simple. When space is at a premium, being able to move the engines aft of the transom is certainly an advantage. For fuel economy, one outboard engine can



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be shut down for extended low speed runs. Finally, cost and ease of repair definitely favor the outboards. For more information, see the Twin 150s at your Yamaha dealer.

BENNETT/GREENSTONE AWARD

Peter B. Bennett, Ph.D., D.Sc. is the recipient of NAUI's Leonard Greenstone Diving Safety Award. The announcement was made at the 1985 International Conference on Underwater Education in San Diego in November. Dr. Bennett was in Germany so the award was accepted by Dr. Glen Egstrom.

The award was made for Dr. Bennett's role in the creation and successful operation of the Diver's Alert Network (DAN). He is the director of DAN as well as director of the F.G. Hall Environmental Lab at Duke University Medical Center in Durham, NC, where DAN is headquartered.

The award was instituted by NAUI instructor Leonard Greenstone to encourage contributions toward safety in all aspects of diving. It is open to all persons throughout the world, regardless of their organizational affiliation.

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COLLECTING AND PRESERVING SKIN DIVER

An SDM Reader Offers Good Tips . . . And Trivia Tidbits

BY ROBERT FINCH

Since the first issue of The SKIN DIVER was published, literally thousands of stories, articles, special features, etc., have appeared within its covers. Many of these have dealt with the collecting and preserving of everything from abalone and other seashells to old bottles and ships, from mastodon bones and pieces of eight to postage stamps depicting our fantastic underwater world. The list is limitless. One important technique has been overlooked until now: the preservation of a set of SKIN DIVER Magazine.

HISTORY

December 1951, California: The diving community witnesses the birth of The SKIN DIVER. Literally put together in the corner of the living room by Jim Auxier and Chuck Blakeslee, the first issue was black and white throughout with a two color cover. Including the covers, it contained 16 pages, two underwater photos and a few surface pictures. Supported by six advertisers, complimentary copies of the first issue were sent to all known clubs, sporting goods stores and manufacturers. The cover price was 25¢, or $3 for a one year subscription.

When subscriptions were mailed, the issues were folded in half and sealed closed with a 2¢ stamp. Owing to immediate and immense popularity, the publishers were beseiged with requests for the first issue. Subsequently, pleas were put in future issues for any extra unused copies. During the early years of publication, hard bound volumes (green) were for sale in January of the following year. A bound volume for 1955 cost $8. In October 1956, the title was changed to SKIN DIVER Magazine.

Over the years, many issues contained various extra goodies. The December 1959 issue contained a free divers flag decal for your tank or car window. It helped serve as a means to educate boaters and the non-diving public about the new divers flag.

In January 1961, Diving News, a mid-monthly edition of SKIN DIVER, was born. A tabloid sized newspaper, it was sent free to all subscribers and designated as the official organ of the Underwater Society of America. Ten separate issues were

published through October 1961. In December it became a quarterly insert in the magazine. The last issue still in newspaper form, and having 16 pages, appeared in September 1962. Subsequently the columns, features, etc., became a regular part of SDM.

The January 1962 issue of SKIN DIVER contained a complete reprint of the first issue. During the mid 1960s many issues contained full page color photos, printed



photo / Jack Geary

on thicker paper, that were suitable for framing. Many issues have contained manufacturers' equipment brochures. The largest, a 16 page 1971 catalogue printed on thicker paper, was included in the December 1970 issue. Three hundred ninety-seven issues (not counting Diving News) were published through December 1984.

COLLECTING

My subscription started in 1961. Like most people, when I was finished reading an issue I would leave it lying around for others to read, pass it on to a fellow diver, or nonchalantly file it with the daily paper. (What will you do with this issue after you have finished reading it?)

By 1967 many of my issues had somehow begun to pile up. It was then I decided to try to complete a set. I was fortunate in that there were a few back date shops in my area and they proved to be a valuable source for issues and "traders." With purchases made at one-third to one-half the cover price, I was off to a good start. By the early 1970s my set was complete back to 1958. At this time a complete set sold for $300. Unfortunately I learned of the sale too late to respond. Now, where was I going to get the rest of the issues I needed?

By responding to, and placing ads in, the Treasure Chest Classified and having letters published in Driftwood, I was able to correspond with other collectors. One had started a club wherein each member was assigned a number. All trading was done through the president of the club. Nonetheless, as a member, I did manage to pick up a few issues.

By the mid 1970s I was corresponding with five other collectors. From time to time, I would also receive letters from individuals wanting to sell their issues, and this proved to be another good source for traders. I teamed up with another collector to purchase a complete set for $500.

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COLLECTING SDM

This transaction netted me a first issue and several other very early issues. At this time I was involved in several different trades and had many issues arriving and being sent out almost daily. Subsequently, the arrivals wound up on the shelf for future perusal.

It was some time later I found a few issues that were missing pages. That discovery almost put me into shock. A first issue was already 24 years old and any incomplete issues or missing pages would have to be replaced. I had no recourse, so I decided an incomplete issue was better than no issue at all.

By 1977 I had been seriously collecting for 11 years. My set was now complete back to 1954, plus several earlier issues. One day, while I was in a back date magazine shop, I spotted an advertisement on a bulletin board. "What books or magazines are you looking for? Let us find them." I wrote to two companies that search nationwide and told them what I was looking for. To this day I have not heard from either one.

By the end of the '70s I was in touch with 12 other collectors and I needed only a few more issues. I had also replaced all but two that had missing pages. By 1980, activities had slowed to a halt, so it was time once again to get back to the drawing board. I decided to write to a sampling of back date magazine shops throughout California. That idea produced nothing more than a good case of writer's cramp. Our group, however, was still slowly growing. By 1981, I was in touch with 16 other collectors and my set was only two issues and two pages short of completion.

During the next two years, there were times when I wondered if I was ever going to pull it off. I was now looking for issues that were more than 30 years old. In late 1983, I received in the mail a list from a collector I had not known. It took one phone call to procure the last two issues I needed. With permission from the publisher and this collector's help, I was able to have my two missing pages professionally reproduced. Early in 1984 my new pages arrived. After 18 long years my set was finally complete, right down to the very last removable postcard!

Before I could take my set to the bookbinders, there was one last detail to take care of. My new pages had to be aged 34 years. Two ideas on how to accomplish this were suggested by other collectors. The first method was to put each page between two pieces of window glass. Taped together, these were then placed on the shelf under the rear window of my car. I turned them over every few days. After three months in the summer, the pages had only aged about four months. It was time to try method number two.

I had more than one dozen copies

made of each new page, which allowed me extras to experiment with. I made a pot of coffee—nothing added, just three pints of water and (after five tries) ten heaping teaspoons of instant coffee. After it was well perked, I poured the coffee into a 12 inch square cake pan on the stove. The burner heat was just high enough to keep the coffee hot, but not bubbling. With the help of a spoon, I slid a page under the surface. Keeping it submerged, I stirred the coffee. After five minutes, I removed the page, turned it over and resubmerged it for another five minutes, stirring occasionally.

I placed an old, clean white cotton T-shirt on a pane of glass and smoothed out any wrinkles. (Any smooth, flat surface will do, but remember that coffee stains.) The page was carefully removed and placed on one-half of the T-shirt. The other half was folded over on top of the page. After blotting gently, the page was placed on a dry window pane and left to air dry. I turned it over once a day. After one week of drying, I compared the new with the old and found that I had a close match color wise. The page was not perfectly flat, however. After placement in the issue, this condition remedied itself in a few weeks' time.

PRESERVING

After some long awaited celebrating, it was time to take my set to the bookbinders to be bound to library specifications. Library binding requires 41 different operations and is a story unto its own. Owing to the weight and thickness of each issue from 1970 to the present, each of these years will be bound semi-annually.

My magazines were bound by: Lo Gatto Bookbinding, 390 Paterson Avenue, East Rutherford, New Jersey 07073.

A few weeks later and having just returned home with 48 books of SKIN DIVER, my thoughts were on the proper climatic conditions for better preservation. Temperature and humidity play the most important roles. While contaminating aerosols and various other gasses can be found in an urban atmosphere, the cost to control them would be prohibitive. Even oxygen has a slow deleterious effect on paper, photographs and other materials. The best temperature would be about 60°F. However, this temperature is uncomfortable for most people. On the other end of the scale, do not store paper etc., above 75°F; 68°F would be better.

The best relative humidity would be between 50 and 60 percent. Air-conditioning can be very helpful, especially a good central unit that can accurately filter, humidify and control climatic conditions. In the absence of air-conditioning, the rule of thumb is to keep paper, etc., in a cool, dry, normal atmosphere where the air is well circulated. Air would get circulated in a bookcase but would not circulate sufficiently in an attic or closet.

(Continued on Page 140)

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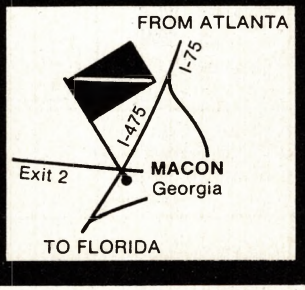
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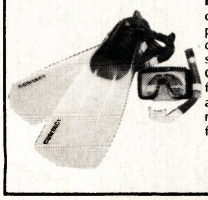
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Diving News From Down Under

1986 Watersport Cruises

TEXT AND PHOTOGRAPHY BY GERI MURPHY

The *Watersport*, Australia's largest live-aboard dive boat, has announced a 1986 schedule of 70 departure dates. Owner Mike Ball says "every trip will go regardless of the number of passengers." Based in Townsville, the vessel cruises among premium dive sites on the outer edge of the Great Barrier Reef. The *Watersport* also makes regular visits to the world famous *Yongala*, Australia's best known shipwreck.

The *Watersport* is a custom built steel hull catamaran, 67 feet long and 30 feet wide. Twin diesel engines power the craft at a cruising speed of 7.5 knots. The vessel will carry up to 24 scuba divers comfortably, plus a crew of 7 divemasters.

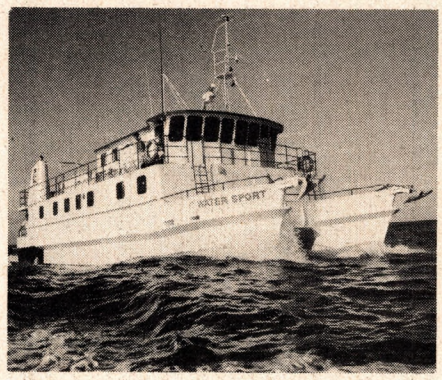
The *Watersport* is one of the only four deck live-aboard dive boats presently operating on the Great Barrier Reef. The lower deck contains cabins and bunks. A new air conditioning system has just been installed for maximum comfort.

The main deck contains dining room, galley, three heads and showers and dive equipment storage area. Meals are served banquet style, at one long table, and there is a recreation lounge to one side. The dining room area is equipped with a large television and videotape player. Full length movies are shown during the cruise. The aft area of the main deck is used for dive gear storage, air fills and dive entries. The vessel is equipped with two Bauer air compressors and 32 aluminum tanks. Twin dive platforms at the stern allow easy exit from the water.

The upper deck contains the wheelhouse, crew quarters, photo processing lab, sundeck and storage area for the vessel's 16 foot Avon inflatable chase boats. This deck is also equipped with a clay pigeon launching device for trap shooting. The top deck is utilized as a helicopter landing pad for passenger arrivals and departures when the *Watersport* is on the Great Barrier Reef.

Activities aboard the *Watersport* extend well beyond scuba diving and snorkeling. Guests participate in windsurfing, paddleboarding, scootering and photography. Night dives are scheduled whenever the vessel is at anchor.

Mike Ball has greatly expanded the *Watersport's* departure schedule for





1986, making the vessel accessible to a greater number of visitors. Divers can book a variety of different trips including two, four and six day cruises.

The two day cruises are scheduled to visit coral reefs in the northern sector of Townsville's Great Barrier Reef area. These include such spots as Grubb, Glow, Myrmidon, Bowl and Lynch's. Diving attractions in this region include shallow to medium depth coral reefs ranging from 15 to 90 feet. There are high coral heads, caves, tunnels, soft corals and a tremendous variety of tropical fish. Visibility ranges from 60 to 90 feet. These cruises are often called weekenders, as they depart on Friday night and return Sunday evening.

The four day trips visit sites in the southern sector of Townsville's Great Barrier Reef and include Anzac, Eagle, Viper, Shrimp, Mid and the *Yongala*. Anzac Reef is a vertical wall with depths ranging from 10 to 100 feet. Eagle Reef is a vertical wall and slope that runs from 15 to 80 feet deep. Shrimp is an undulating coral reef 20 to 50 feet deep. It is loaded with sponges and soft corals.

The *Yongala* is one of the busiest and most beautiful marine life sanctuaries off the Australia coast. The ship serves as a beacon, attracting great schools of fish that constantly swarm over its decks. Several giant, 500 pound Queensland groupers are permanent residents of the ship's hull. A large school of Pacific barracuda hangs in mid-water just above the ship. Below it is another school of 60 pound yellowtails that continuously circles the ship. Other impressive creatures



The 67 foot *Watersport* is a custom built steel hull catamaran that carries divers in live-aboard comfort from Townsville to select sites in the Great Barrier Reef. Two day cruises visit shallow to medium depth reefs in the northern sector of Townsville's GBR. Four day trips visit the southern sector and the wreck of the *Yongala*. Six day journeys visit both areas. Above: Mike Ball, owner of the *Watersport*.

found on the *Yongala* include potato cod, cobia, sea snakes, turtles and rays.

The *Watersport's* six day dive cruises consist of a combination of the two and four day trips, thus encompassing all of Townsville's top dive sites and the *Yongala*. Because of the short duration of *Watersport's* cruises, the trips are very attractively priced.

For more information and a copy of the 1986 *Watersport* sailing schedule, contact: Dive In Australia, 680 Beach St., Suite 340, San Francisco, CA 94109; telephone (415) 928-4480.

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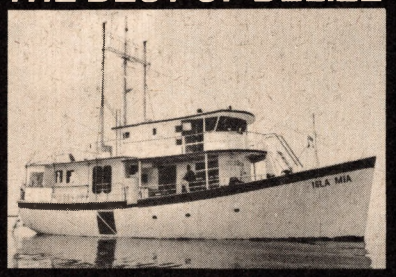
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COLLECTING SDM

(Continued from Page 137)

TRIVIA

Let's take a last look at SKIN DIVER, but this time from a different angle. Three hundred ninety-seven issues combined, including covers, contain 32,664 pages and more than two miles of paper.

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Readers who know of a first issue, complete set or desire more information, are asked to contact Robert Finch, P.O. Box 30892, Tucson, AZ 85751-0892.

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Advertising rates: $153.00 for three consecutive ads, $264.00 for six consecutive ads, $396.00 for a full year. DEADLINE: 28th of 3rd month prior to publication. PAYMENT MUST ACCOMPANY COPY. Send all material to: Diver's Directory, c/o Direct Marketing Division, P.O. Box 69910, Los Angeles, CA 90069.

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I Learned About Diving From That

Trapped In A California Cave

BY HOWARD HALL

Underwater speleology is a compulsion I have enjoyed great success in resisting during my two decades of sport diving. And, owing to herculean strength of will, I have managed to learn almost nothing about the affliction. I do know there are at least two types of cave divers: Florida cave divers and California cave divers.

Florida cave divers regularly demonstrate their courage and madness by entering the sponge-like labyrinths of underground rivers and caverns that form the geological foundation of their state. They often descend hundreds of feet and may penetrate a mile or more. And, more often than rarely, they don't come back.

California cave divers test their intrepidity by discovering two large boulders leaning against each other and crawling in between the two. They know they are in a cave if they need to turn their lights on in order to see the back of the chamber. California cave divers generally die of old age.

I'm strictly a California cave diver, which is to say that I'm not a cave diver at all. I was correspondingly prepared for a cave dive when my old friend Larry Cochrane and I discovered a large crack in the wall of an island off the coast of San Diego. This is to say I was as poorly prepared as possible.

Habitually, I had my still camera with two strobes attached. I had no light and, of course, neither of us had a line. Since Larry did have a light we decided to swim on in for a look around. After squeezing through the crack we were surprised to discover a cavern and the twisting path of a cave that extended beyond the beam of Larry's light. He suggested we explore farther and I capitulated.

At this point you might ask yourself (as I asked myself at the time) which of the following axioms you would use to limit your penetration into a cave.

(1.) Proceed until you find the end of the cave or run out of air.

(2.) Proceed until you have used one-third of your air supply. Then turn around and follow your silt trail out.



(3.) Proceed until you find yourself frightened half to death and then see if you can find your way out.

(4.) Do not go beyond sight of the cave opening.

(5.) It's dark in here! Turn around and get out immediately.

With an attempt at logic as applied to safety, I chose axiom number 4. I decided I was safe as long as I could see light coming through the opening. So, with blissful confidence in my logical analysis of the situation, I followed Larry into what we would later call Godzilla Cave.

Larry and I passed through several twists and turns, but I could always see light from the entrance. Soon, however, we came to a 90 degree bend down. Without a moment's hesitation Larry went right on in. I tried to grab one of his fins but was not quick enough. I knew that beyond the hole he would no longer be able to see the entrance. Evidently, Larry had selected axiom 1. I decided to wait for him where I was.

After a reasonable period of time (four or five seconds) I decided I had certainly waited long enough and would just mosey my way out of the cave. I turned and swam toward the glow emanating from the entrance. However, after four or five yards I discovered the flaw in axiom 4: I could not fit through the passage! Although I could see the light coming from the opening, there was not enough light to illuminate the obstacles in my path and there was no way I could get through the hole. As I swam around looking for a larger passage, the opening disappeared.

After 30 seconds of this stimulating little game, I noticed several disquieting changes. My air consumption rose dramatically and I began to fear I might entirely inhale the second stage of my regulator. I also discovered an all but overwhelming desire to check my pressure gauge despite the certain knowledge I had had 2,500 psi only ten minutes earlier. In addition, the expensive camera I was carrying suddenly seemed rather burdensome and hardly worth the ridiculous price I paid for it. So, I considered leaving it behind so that I could get a better feel of the rock that blocked my exit. I began to wonder why I ever took up diving in the first place and even what I had ever found pleasing in an ocean sunset.

After less than a minute and just short of a lifetime Larry returned. I noticed immediately that his eyes were as big as dinner plates (he, too, had enjoyed several moments of adrenaline high when he turned to find me missing and no fewer than three possible tunnels through which he had just passed). Larry suggested leaving the cave with haste. Reluctantly, I agreed.

When Larry shined his light on the spelean architecture that had inhibited my earlier attempts to depart the cave, I discovered I had been viewing the cave entrance through a long crack. Our entrance into the cave had actually been made ten feet to the left and below where I had attempted to exit. Sooner or later I would have found it—I think.

What did I learn? I learned never to assume you can find your way out of a cave simply because you can see light radiating from the entrance. I also developed two new precepts to add to my personal axioms of safe aquatic spelunking:

1.) Treat all caves with the respect you would ascribe a Floridian cave.

2.) Stay the hell out of Floridian caves.

SKIN DIVER VOL. 35 NO. 3
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